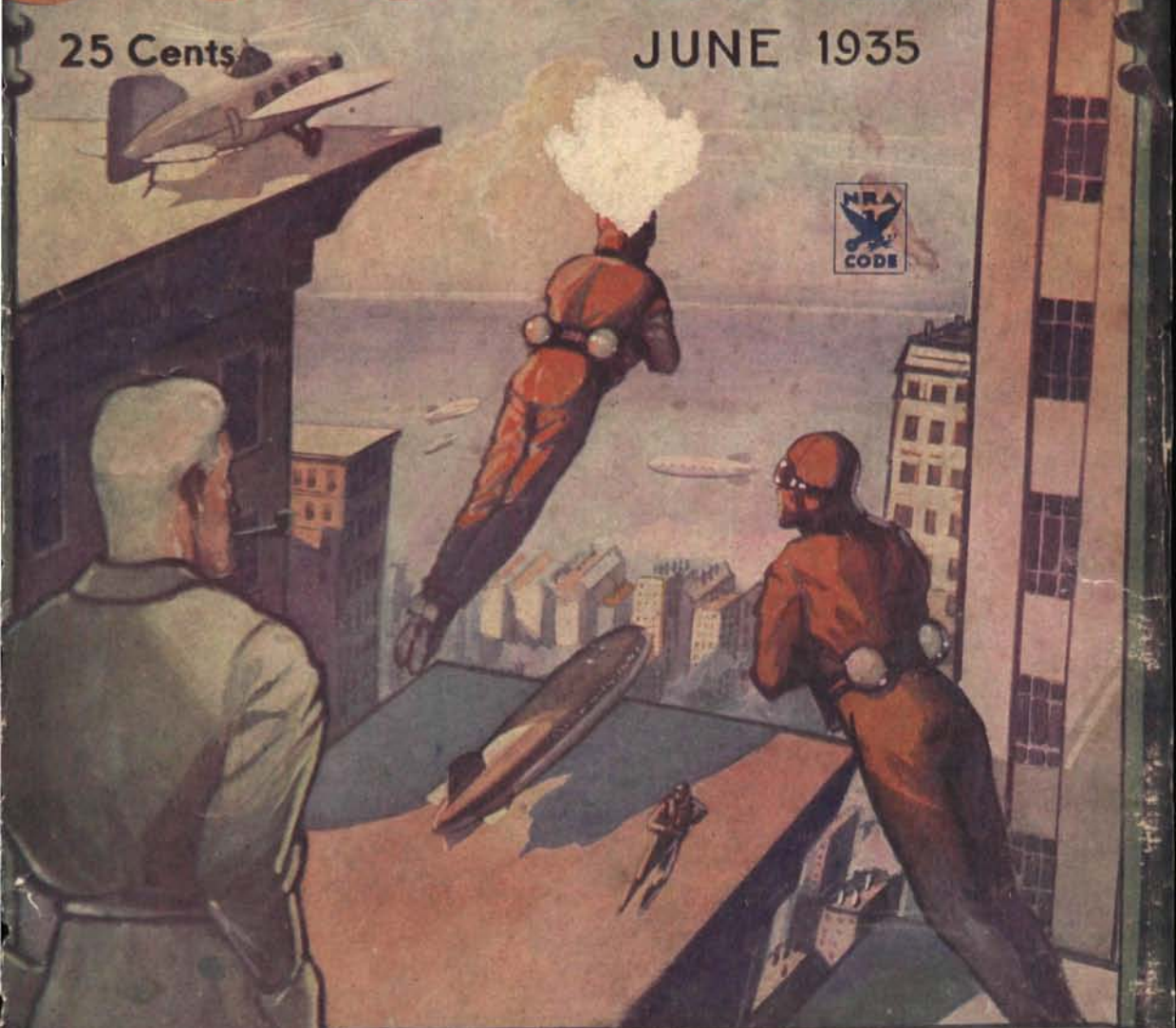


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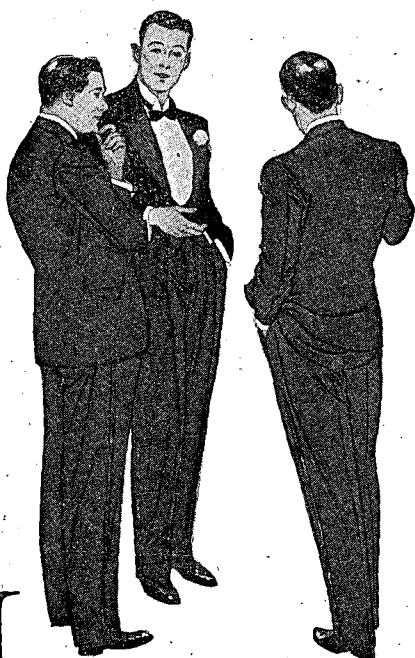
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AMAZING STORIES

Science Fiction

Vol. 10

JUNE, 1935

No. 3

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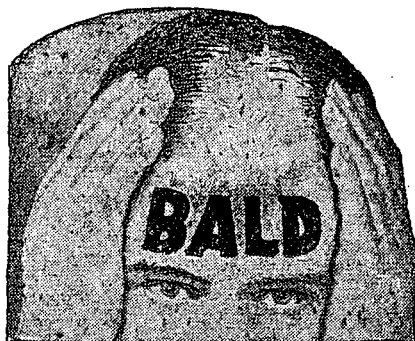
Lee Ellmaker, Pres. and Treas.

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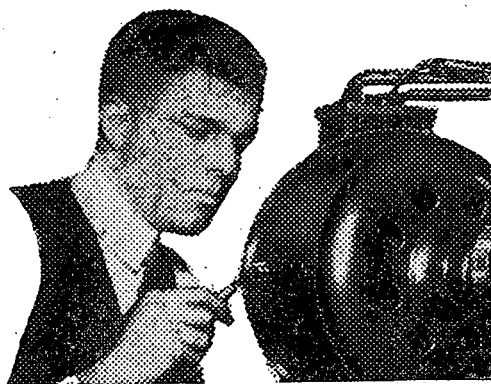


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28x5.25-18	2.90	1.15	32x4.75-18	3.55	1.20
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31x5.50-55	3.35	1.15			
31x5.50-56	3.35	1.15			
31x5.50-57	3.35	1.15			
31x5.50-58	3.35	1.15			
31x5.50-59	3.35	1.15			
31x5.50-60	3.35	1.15			
31x5.50-61	3.35	1.15			
31x5.50-62	3.35	1.15			
31x5.50-63	3.35	1.15			
31x5.50-64	3.35	1.15			
31x5.50-65	3.35	1.15			
31x5.50-66	3.35	1.15			
31x5.50-67	3.35	1.15			
31x5.50-68	3.35	1.15			
31x5.50-69	3.35	1.15			
31x5.50-70	3.35	1.15			
31x5.50-71	3.35	1.15			
31x5.50-72	3.35	1.15			
31x5.50-73	3.35	1.15			
31x5.50-74	3.35	1.15			
31x5.50-75	3.35	1.15			
31x5.50-76	3.35	1.15			
31x5.50-77	3.35	1.15			
31x5.50-78	3.35	1.15			
31x5.50-79	3.35	1.15			
31x5.50-80	3.35	1.15			
31x5.50-81	3.35	1.15			
31x5.50-82	3.35	1.15			
31x5.50-83	3.35	1.15			
31x5.50-84	3.35	1.15			
31x5.50-85	3.35	1.15			
31x5.50-86	3.35	1.15			
31x5.50-87	3.35	1.15			
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31x5.50-90	3.35	1.15			
31x5.50-91	3.35	1.15			
31x5.50-92	3.35	1.15			
31x5.50-93	3.35	1.15			
31x5.50-94	3.35	1.15			
31x5.50-95	3.35	1.15			
31x5.50-96	3.35	1.15			
31x5.50-97	3.35	1.15			
31x5.50-98	3.35	1.15			
31x5.50-99	3.35	1.15			
31x5.50-100	3.35	1.15			

REGULAR CORD TIRES

CORD TIRES		
Size	Tires	Tube
30x3.....	\$2.25	\$0.65
30x3 1/4.....	2.25	0.75
31x4.....	2.95	0.85
32x4.....	2.95	0.85
33x4.....	2.95	0.85
32x4 1/4.....	3.35	1.15
33x4 1/4.....	3.35	1.15
34x4 1/4.....	3.45	1.15
30x5.....	2.65	1.35
33x5.....	3.75	1.45

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Extravagant Fiction To-day Cold Fact To-morrow

The Old and the New Atom

By T. O'CONOR SLOANE, Ph.D.

IN the early days of science an idea or theory was evolved, which was more in accord with the basic theories of modern times than it is generally supposed to be. The conception was that there were elements, which formed the basis and foundation of all matter and its phenomena. These elements were four in number—earth, water, air and fire,—and they are an impressive example of early thinking and theorizing. They comprise the three states of matter, solid, liquid and gaseous and the great fundamental conception of heat, by which the changes, implied by the other three elements of old, are brought about. Thus ice is a solid, and heat converts it into a liquid and after that converts it into steam, which is a gas. This gives us an example of the elements as theorized about many centuries ago, solid ice, liquid water, gaseous water and heat. It sometimes seems as if the progress of the natural science of to-day was bringing us step

by step nearer to the great four of the ancient world of science.

In the world of matter one of the definite limits is the solid state. When by reduction of temperature this condition is brought about one extreme state of matter is the result. There is no change beyond the solid state. The qualities of solid matter, its cohesion, reaction to an electric excitation, its tensile strength, resistance to compression and similar qualities are affected in degree by subjection to various factors, but there is no change from the solid state, until it succumbs to some molecular disturbance, as when the liquid state is produced. Heat is the great disturber of the solid state; many solid substances become liquid when heated, as we all know.

If heat is applied to liquids they evaporate, they are converted into gas and disappear from view in many cases. If kept in the liquid state long enough liquids will generally assume little by

little the gaseous state and disappear slowly in most cases—if given time and space they will completely disappear. Solids are distinguished by the possession of hardness, cohesion, and color. Liquids have color often, but neither of the other two qualities. Gases have no hardness, no cohesion and some have color. It is fair to say that most gases are colorless.

All this is very simple and a great deal more could be said about the changes of state of matter. The above general statement shows that there was much good in the old time definition of the states of matter implied in the elements; they represent the three states of matter, changed one into the other by the action of heat. The words "earth, water and air," may be taken as expressing the three states of matter in general.

This ancient statement of the division of the world of matter and of the action of heat upon matter, gives the basis for much of physics. Chemistry it cannot be said to touch. It is a very creditable effort on the part of the philosophers of the ancient world to express the foundations of their science. It was very incomplete—a good many centuries had to pass before it was in any sense completed.

As the world drifted along, the old-time scientists did some good work. Glass is a chemical combination, and how it was discovered or first made is a mystery, not satisfactorily solved by the story of the shipwrecked sailors with their cargo of lumps of sodium carbonate. How the ancient metallurgists in various parts of the world learned to reduce iron from its ores is a problem. Yet in the crudest kind of open hearth process the purest iron was produced twenty or more centuries ago. In present metallurgical practice much of the impurities of common iron are derived from the fuel. The ancient metallurgists used charcoal in their furnaces and this

was the reason their iron was so pure, as charcoal contains no sulphur and little silica.

As the primitive chemistry of early days developed some acids were produced. Sulphuric acid was obtained from iron pyrites and as it was of oily appearance when concentrated, it was called oil of vitriol. Why the term, vitriol, interpreted as glassy, was used, is not very clear. It probably referred to its glassy appearance. When the 'acid of brine' which can be obtained from sea water, was to be named, it was called muriatic or 'briny' acid. One comfort about the ancient nomenclature is that so few chemical compounds were known that the names were short. There were no such names as diazaminobenzene, and that is a very short one as chemical names now are. So chemistry, such as it was, went slowly ahead. The idea was formulated that the chemist must transmute baser metals into gold. Alchemists were not only prompted by the desire for pure chemical researches, they made undirected attempts at the transmutation of metals. Gold was what they wanted, and while some were honest enough though utterly futile in their attempts, others were fraudulent in their work. They would hide some gold in their crucible and after the firing, they would produce it and claim that they had made it. The fraudulent practices became so frequent as to lead to various legal prohibitions of efforts at transmutation.

An impostor, a confidence man of old times, would get some one interested in the idea of producing gold from lead or other metal. By doing the work in some fraudulent manner, he would claim that he had made it from lead or other cheap metal or material.

But during the long period preceding the nineteenth century, a number of discoveries were made, and the old names given to various substances are very

interesting. Silver was called argentum, which is derived from the Greek word meaning "white," so we can go centuries back of the agitation for coinage of silver, if we wish to call it the "white metal," as it was termed a few decades ago in this country.

The word now used for this metal, namely silver, runs the gamut of many languages, but is of uncertain origin. Mercury which resembled it in color and luster was called hydrargyrum, or water silver because it was fluid. The name "mercury" which it now has, expresses perhaps its activity, for the mythological god, Mercury, was supposed to be a very lively individual. If you spill a little mercury on a table you will find that it is certainly very active if you try to pick it up. But do not let it touch a ring or any gold object or it will injure it. The mineral iron bisulphide is sometimes so hard that it will "strike fire" with steel. It has been used in place of flint. The name pyrite from the Greek word for fire 'pyr' (pur) is based on this peculiarity. The word copper is derived from Cyprus, a place once celebrated for its copper mines and workings. Another local name is ammonia from Jupiter Ammon, near whose temple its salt was found.

The two principal alkalies, sodium and potassium were known in some of their salts and as ammonium compounds were volatile; potassium and sodium compounds were referred to as the fixed alkalies. The name of potassium is of etymological interest. The carbonate of the alkali was made by boiling woodashes in a pot and was very properly called potash. This was certainly a descent from getting names from the Greek and Latin tongues.

So the theory of chemistry advanced very slowly. The curious conception of phlogiston was brought in at about the middle of the eighteenth century. This

sometimes led to the idea that adding phlogiston to a substance reduced its weight. In an interesting note (AMAZING STORIES, August, 1934) Mr. John W. Campbell, Jr., cites a statement, to effect, that if we take phlogiston as meaning potential energy, it would be perfectly valid as a conception. This is quite a novel point of view, for phlogiston, which is now erased from the records, appears from the above statement not to be a contradiction of the conservation of energy and of matter.

So the chemists worked along for years and centuries, not realizing what a revolution was impending, until Lavoisier the great French chemist in Paris, and Priestly, the English radical, the latter working in Pennsylvania, discovered oxygen and the modern chemistry was born. The discovery of oxygen belongs to each of these investigators, practically the discovery was simultaneous, the two working 3,000 miles apart.

The theory of the four elements was definitely stated nearly 500 years before the Christian era. With the modification based on the phlogiston theory and with the addition by Aristotle of the celestial ether about two centuries later, there was little change in theory, but the so-called alchemists of olden times were doing good work considering the theoretical darkness in which they worked. When the monumental discovery was made that oxygen and metallic mercury could be produced from mercuric oxide, and that the gas and the metal could be reunited giving the same red oxide of mercury, the conception of binary chemical compounds was presented to the world of eager investigators, and the four or five element theory was abandoned to the physicists. Brilliant investigators at once seized upon the great discovery of those days, about the epoch of the American revolution, and the conception of the chemical elements was formed and

the discovery of element after element was announced, until a considerable list of them was produced and chemistry seemed to have the mystery dissipated which had enshrouded it for so many ages and all began to go smoothly. For what could be simpler and more logical than that matter should be composed of a lot of elements, (92 in number according to present theory) and that these combining chemically should produce all sorts of substances widely different from the elements of which they were built up. It was as if in laying up a brick wall, the bricks disappeared and a new substance was produced. Bricks do not do this, but the chemical elements do it.

It seemed that there was peace at last. There were sixty or seventy elements, now we know more than ninety. The ultimate division of matter was taken as the atom, the smallest particle of an element, but soon more theorizing came in and the atom was said to consist of two separate parts, positive and negative electrons and at once theorizing about the atom started and it was said to be made up of positive and negative charges, with the weight of the atom concentrated in the positive electrons.

Long ago water was expressed as H O , because there was supposed to be one atom of oxygen combined with one of hydrogen, and other compounds were given the same law of volumes of component parts of the molecule. The molecule is the smallest possible division of a chemical compound. But while water was decomposed into its component gases, exactly twice the volume of hydrogen compared with that of the oxygen was produced. Therefore the old H O was changed into H_2O , following Avogadro's law to the effect that the molecules of compound substances and of elements have the same volume when in the gaseous state. The writer of these lines used the old system of chemical nomenclature

for his first year in college. Water was H O , sulphuric acid was H O, S O_2 , and so on. Now water is written H_2O , and sulphuric acid, H_2SO_4 , and corresponding changes are applied all through the vast field of chemistry, and the change from the old system to the "new system," as it was called, was quite difficult to be grasped, but it had to be done. Some of the eminent, old time chemists never succumbed to the more logical new system.

And during the centuries the "atom" has suffered radical changes. It was defined as the smallest possible particle of any substance, and the name expresses this, for it means indivisible or more exactly "uncut." The particles of a pebble, of a piece of wood or of any other substance, when so finely divided that division could go no further, was in ancient times called an atom. Then when the great discovery of oxygen was made, mercuric oxide was found to be divisible into oxygen and mercury and there was no longer any such thing as an atom of the mercury compound. A new name, molecule, was applied to the old atom and the development of chemistry went on with great rapidity. When the science reached the point of distinction of compounds of atoms as molecules, and uncombined elements as atoms, a breathing-space seemed to come, and except for the discovery of new elements peace began to reign. But then recent discoveries and theories of the constitution of the atom came in quick succession, the atom, being divided theoretically into electrons, and one theory followed another, so there is no knowing what the future will bring out. But in working chemistry the Lavoisier-Priestly discovery still holds, and if the atom has its nucleus of positive electrons, sometimes also of negative electrons, and if it has some of its negative electrons outside the nucleus, it does not affect what may be called working chemistry.

Liners of Time

By JOHN RUSSELL FEARN

Part II

The author of our story, of which this is the second part, has won the definite favor of our readers. The paragraph touching on what went before will enable those who have not read the preceding chapters to follow the story.

What Has Gone Before:

Space-pilot Sanford Lee is ordered to take his ship, Liner 48, in place of the regular passenger ship, scheduled to leave on the morrow, and investigate the disappearance of five liners out in space. Elna Folsom, daughter of the President of the Age 20,000 and Elneck Jelfel, Master of the Age of Problems, are among the passengers on Lee's ship. Elna and Lee are old friends. Out in space Elna disappears from the ship and, in trying to find a clue, Jelfel's room is entered and found to contain curious machinery. Lee also disappears from his ship and when he comes to his senses he is a prisoner in the Age of Problems. Jelfel, who also has left the liner, destroys Lee's ship before the pilot's eyes, with all hands on board. After this horror, Jelfel states a proposal and his ultimatum is—"No more time liners!" While Jelfel awaits a reply to his proposal, he explains various machines to Lee. Lee discovers that Elna is in the same prison and, catching Jelfel off guard, ties him up after a hard combat. The pilot finally liberates Elna and together they are just about to escape back to their own time when Jelfel appears. Although the switches on the machine have been set for the year 2,000, Jelfel pulls something and Elna and Lee find themselves transported back to an ancient geologic age. In this age they meet Martian Luminosities, who feed and care for them. The Luminosities tell Elna and Sanford that a time machine will arrive, the one which was sent into the past by the great Carreno, and in this machine they can return to their own age. When the machine arrives, the Martians, setting the controls for the age 2,000, send the ship on its way with Elna and Lee therein. They pass through ages and emerge in the Age 2,000 near the old-time laboratory of Carreno.

CHAPTER VII

The Shattering of New York

WE returned to the year 2000 A.D. in Ino Carreno's original laboratory, turned, as I have explained elsewhere in my narrative, into a museum for those curious and interested enough to observe the actual environment of perhaps the world's greatest scientific genius.

Since the test time machine had not moved in space at all, and since it was fitted with a terrestrial gravitator to hold it always to the earth in her passage round the sun—and also because the original site of Carreno's laboratory had not been moved at all—we merged into the mundane again through the medium of falling out of the time line to the floor. I had been unprepared for the arrival. I could not bring myself to believe that the intelligence of the gaseous Martians could so faultlessly have set the switch to 2000. However, they had done so, and, being such a fool as to disbelieve, I succeeded in causing both Elna and myself a pretty rough landing.

Fortunately we were none the worse,



*The building appeared to be anchored to the ground by fine tendrils.
The same could be said of the very earthly looking man.*

save for minor bruises, and opening the rubber sheathed air-lock we stepped out upon the wooden floor. The museum was all in darkness; all about us, tabulated in orderly fashion, only just visible in the reflected light from New York's city lights, were the instruments with which the great Carreno had once worked.

"All safe," I whispered, taking Elna's arm. "We're back, thank God! The job now is to find the way out of this place. Come on."

On tip-toe we went to the door. As I had expected, it was locked. Turning, we made for the window. This proved an easy matter, and within a few moments we were out on the fire escape, with the panorama of New York's glittering lights and beacon-towers before us—the same spot where the valley of gas intelligence had existed thousands of years before! Never before had I realized quite so vividly how much a man relies on beings akin to himself to keep him alive.

At the bottom of the fire escape, which led into a little deserted alley, we held a brief consultation.

"No use doing anything to-night," I said. "Besides, we don't know what day it is, or how long we've been away. I'll go first thing in the morning and see Templeton, and warn him of the danger. You'd better come with me for verification. I'll pick you up at your apartment at eight sharp to-morrow. How's that?"

She nodded. "That'll do splendidly. I'll have to take the quietest route home—certainly not along the pedestrian ways or I'll be arrested for indecency or something. Look at the mess I'm in. I look like having a job getting my apartment back again. I'm supposed to have returned to my own Age in 20,000, you know. Ah, well, all in a day's march. See you to-morrow."

"Right. Sleep well!"

"Who couldn't after what we've done?" was her parting shot, and with a merry laugh she turned and vanished in the night.

Here, in case any of you in the past might think my manners crude, I had better explain that in the Age 2000, men and women were treated as equals. Whilst woman was still considered the weaker sex physically, she was admitted to be every whit as clever mentally as any man—and sometimes more so. All the old-time curriculum of hat raising, bowing, kissing, taxi-calling, and so forth was buried underfoot by the march of progress. Whether wisely or not is not for me to state here.

I found my flat exactly as it had always been. At my entrance, which by the way I made by the fire escape, my servant, Hilton, came into the drawing room, stopped in horror, and then rushed forward.

"Good heavens, sir, whatever has happened?" he asked blankly, pulling forth a chair and quite needlessly helping me into it. "Pardon me, sir, but have you been involved in an accident?"

I filled myself a glass of ekrimar, a beverage of the time, and drank it down in one clean gulp. Hilton watched me with something like awe in his pale, solicitous face. It was not often I used so forceful a refreshment.

"Hilton," I said grimly, "I've spent half a day and all one night in an age before the coming of man!"

"You astound me, sir. I really do not know what things are coming to."

"I do, Hilton. There's trouble coming—hellish trouble—unless I can stop it. We are going to be shattered to pieces. The cause of all the trouble lies in the Age of Problems, and the Master of that Age is a bright specimen called Elnak Jelfel. He tried to be rid of Miss Folsom and me by hurling us into pre-history. Thanks to a test time-machine

made by Carreno we got back," and so I told him of our various experiences. When I had finished he stroked his smooth chin. Hilton was more to me than a mere servant. Frequently I had found him a very intelligent adviser.

"It was this man Jelfel then that destroyed the time-liners, sir?"

"It was. Templeton shall know everything in the morning."

Hilton shrugged. "I shouldn't place altogether too much assurance on the President, sir. Corporations are not gifted with imagination."

"They'll have to believe me!" I answered grimly, fingering my empty glass.

"Yes, sir. As you say, sir. The news came through on the radiovisor last night, about Jelfel's ultimatum. The President seemed to imagine the whole thing was a hoax."

"He would!" I snorted, rising to my feet. "Damn it all, you'd think after all this time that Governments and Corporations would try and be sensible—but no! Always the same doubting suspicion; always the same difficulty in making oneself heard and understood! They make me sick, Hilton!"

"Yes, sir. Would you care for a meal, sir?"

"Yes—I'll have a bath and a change whilst you prepare it. Oh, by the way, what day is it?"

"Thursday, sir."

"Ah! Then, including my time on the liner, I've been away about four days, and one day since Jelfel's ultimatum. Hmm, I may yet be in time . . . All right, Hilton, just talking to myself."

"Yes, sir, so I gathered."

EIGHT-THIRTY the following morning saw Elna and me, both neat and spruce again, being ushered into the Debating Chamber of the Time Liner Corporation. To be sure of a full audience for my most important

narrative, I had made the appointment the night before over the teleadviser. The earliness of the hour meant nothing.

Sure enough the entire complement of directors were present at the horse-shoe table, with Templeton, as usual, in the center. I saluted smartly and Templeton bowed very slightly, as was his wont. I remarked, however, a curious stiffness in his manner and a cold glance in the ice-blue eyes.

His opening words were not reassuring.

"Well, Commander Lee, what have you to say?"

I didn't know whether to construe that sentence as a question or an invitation, so I plunged straightway into my story.

"I have called you together, gentlemen, to warn you of an attempt being made by the Master of the Age of Problems to secure complete control of all the ages from this one up to his own—22,000. He it is who is responsible for the constant loss and wrecking of our time liners; he also it is who sent that ultimatum to you and President Folson. We have got to fight him, gentlemen. If not, the ruination of our cities, our Age, and our people, will be the result."

The craggy lines around Templeton's mouth did not budge at my remarks. Instead, he leaned slightly forward across the table and gazed at me long and steadily with those boring, implacable, eyes. I read in them a growing hate and ruthlessness, and vaguely wondered why.

"Perhaps, Commander Lee, you will be so good as to tell us why you deserted your ship in the time of need? Why you were nowhere to be found when danger threatened?"

I started violently and gazed at him blankly. I spread my hands. "But, sir, I was positively kidnapped from the ship. Both Miss Folson and myself

were powerless in the hands of Jelfel. He was a super-man of science."

Templeton's thin lip curled slightly. "We had the radio-vibrator on your ship all the time, Commander, and we distinctly saw you enter the suite of this young woman here—Miss Folson. But you *did not come out!* What you went in for, you know best yourself. The next thing we heard over the radio-vibrator was the cry of Aldbury, your sub-engineer, for assistance. He called for you—you were the only man to give orders on the liner; the only man capable of stopping the ship when that mysterious force was found to be close upon it. But was there a sign of you? No! You had gone in Miss Folson's room, and that was all! As you know, the radio-vibrator covers the whole area of the decks and engine rooms. We cannot see into cabins and suites. What were you doing, Commander Lee?"

"Good God, President, you don't mean you're accusing me of—of—desertion?" I stopped, my brain whirling at the ruthless construction that had been placed on my quite innocent actions. "I went from Miss Folson's cabin *via* a connecting door to the suite of Elnak Jelfel, next door. He had kidnapped Miss Folson, and I meant to find the reason for it. I never left his suite in person. He projected my atoms into his own Age—22,000."

"Yes, and my atoms as well!" Elna put in hotly. "You have no right to dare to suggest anything else, President Templeton!"

"I speak the mind of the Directors at large," Templeton answered coldly. "It matters not to this organization, Miss Folson, whether you be the daughter of President Folson or not. Duty is merciless—but just!"

"Just!" Elna echoed in derision. "Hand me the ekrimar, somebody!

Every word that Commander Lee has spoken is absolute truth."

"We rely on machines, on radio-vibrators, that cannot lie," Templeton said, his lips closing like a vise. "You will now explain, Commander Lee, where you were all day yesterday, and how you managed to get off the time liner before it was flung into sub-atomic space."

"I have told you, sir!" I said almost despairingly. "Miss Folson and I were projected into the Age of Problems. Then, in our efforts to escape we were outwitted by Jelfel and flung into prehistory, amongst the age of monsters."

"Indeed. And how did you get back?"

"By the test time machine Carreno sent into the past many years ago. You can see it now in the museum. The time, Miss Folson and I landed in, happened to coincide with the time of Carreno's machine."

"Granting the truth of that statement, it would take you years to get back. You did it in a day! Explain that, Commander Lee."

"We encountered great intelligences. They helped us. . . ." I felt the net drawing round me inextricably.

"Great intelligence in a prehistoric age?"

"They were from Mars, President! For God's sake, you've got to believe me! The very safety of an age—of all future ages—depends upon it!" My voice rose to the great roof on a rising note and died away into silence.

Just silence. I realized how hopelessly awry everything had gone. Mule-headed disbelief! Damnable, infernal machines that misconstrued everything! Hilton had been right in his assumption, after all. I could have cursed aloud. Poor Elna was nearly on the point of hurling herself on the cold, inscrutable President, so violent was her inward rage.

"Commander Lee—Elna Folson—it

has been proven that you are lying. You, Commander Lee, in particular. You were missing from your ship when you were most needed; you knew when that ship would be blown to atoms, so vanished in a safety machine with Miss Folson before the event occurred. In some Age—whether the Age of Problems or otherwise I am not prepared to say—you sent forth those ultimatums, mainly because you knew they would never be acceded to, and also because it would seem that you and Miss Folson were being held as involuntary hostages. After that, knowing the plan had failed, you returned—which would only be a day's journey—to this Age, with this unutterable tissue of falsehoods! Commander Lee, you will be relieved of your commission forthwith! Come here!"

"But, President, I swear to you by heaven above that I am telling the truth! You have *got* to listen! We escaped from that Age. We have come to warn you—to have the necessary facilities to carry war into the enemy's camp!"

"Commander Lee, you will please be silent!" Templeton ordered stonily, then as I mechanically reached his table he extended his arm and swiftly wrenched the badges of authority and power from my uniform. They tinkled on the metal floor. I stood looking down at them dumbly, bereft of all power to think for the moment. The glaring, fiendish injustice of it all engulfed me.

"You fools! You insane fools!" Elna shouted, striding forward and glaring into the unmoved President's face. "My own father would have had more sense—he would have listened! But you . . . Bah! You're nothing more than bunglers—muddle-headed, stone-brained idiots!"

"Your own father, Miss Folson, would do exactly as duty merited," Templeton replied calmly. "Whether you be related or not you are one of the com-

munity, and you must suffer if you outrage the laws of the community! You have assisted Mr. Lee in his nefarious work, and no mercy will be shown. You hear, Mr. Lee?"

The "Mr." stung me to the quick. I looked up and glared sullenly.

Templeton paused for a space and considered the matter, assisted by the mutters of his fellow-directors. Elna and I stood looking at them, stupefied. Then presently Templeton spoke again.

"Sanford Lee, you are found guilty of the highest treason—the wrecking of time-liners by some form of electrical energy from some inaccessible spot in the time line. You are also found guilty of desertion and endeavoring to wrest control from the Corporation by false representations. The penalty is death—to-morrow morning."

I staggered as though I had been forcibly struck. "What!" I gasped dazedly.

His monotonous voice went on. "You, Elna Folson, are found guilty of aiding and abetting Mr. Lee in his work, but are not guilty of treason. You will be sent to the Machine Factories at Polar City for a period of seventeen years. That is all."

"But—but—" I began hopelessly, the faces before me seeming to dance in a mist. "You're signing your own death warrants! It means—"

"Be silent!" Templeton ordered curtly. "Guards—your duty!"

The two guards by the door strode forward and seized Elna and me in an iron clutch. We were both of us too utterly dumbfounded to comprehend matters fully. Death for me! Seventeen years in the terrible Arctic workshops for Elna! Why, the thing was absurd—insane! There must be a mistake! My mind whirled in giddy orbits of irresolution as we were both piloted down various regions of the great edifice. I remember

seeing a grilled door open and shut, heard a metallic clang, and then realized I was in a cell.

Stupefied, I sat down on the hard bench and felt at the place where my medals ought to have been. Death! Death! Death by the dematerializer—to be dissolved into atoms for trying to save an Age! Good God! Was this, then, the outcome of education and machinery?—that it should condemn two innocent beings without a hearing? One to death, and the other to a small lifetime of perpetual toil? I groaned deeply and sank my aching head in my hands.

I DO not know how long I sat trying to think things out before I heard Elna's voice from the next cell. I rose to my feet and crossed over to the door. For the moment the corridor outside was free from guards.

"Sandy, have you thought of anything?" she asked. "For all the good we've done, we might just as well have stopped behind and provided a diplomatic with a good dinner. It would have been useful, anyhow!"

I swore violently.

"Oh, what's the good?" I snarled. "Ruthless law, ruthless decisions! No chance at all! The blistering, damnable—"

"Turn off the gas," she said tersely. "That won't do any good. The thing to do is to think of a way out. How I wish I were a Martian!"

I stilled the string of invectives I had marshalled into perfect order, regretting that I could not blast forth for once in my life.

"There isn't a way," I told her. "The prison is guarded from floor to roof, and these doors can't be shifted. We're absolutely cooked, Elna. Done for! By God, how I'd like to tear the heart out of that devil, Jelfel! He's responsible

for all this. One can't altogether blame the views of Templeton."

"Oh, can't one!" Elna objected truculently. "I blame him for one! He relies too much on machines! My own father would not have—" She stopped. Then, "Did you feel that?"

"Yes," I said, and stood still for a moment. I had distinctly noticed a peculiar trembling of the floor, as though an engine were at work somewhere under ground, and its vibrations were making themselves manifest. It stopped for a moment, then it began again with increased force, becoming gradually stronger, until it felt for all the world as though a colossal dynamo were at work underneath the building.

"What on earth is it?" Elna asked at last.

"Hanged if I—" I began; then suddenly it dawned upon me. An extraordinary feeling that was both relief and anxiety swept over me. I gripped the bars of the door. "Elna!" I panted. "Elna! It's Jelfel's vibrator machine! You remember—he told us it would raze every building in the Ages to the ground by vibration. He told me, anyhow, and I told it back to you. He's started the war he promised. . . ."

"You're right!" she breathed. "Then that means—collapse!"

"Let it collapse!" I snapped. "It'll perhaps teach them a lesson. Whoa! He's putting the power on, isn't he?"

At that moment the vibration had increased to a positive shaking. I could feel my body and the wall and door of the cell trembling at top speed as the vibratory force increased. Feet were echoing down the passage now, feet running in alarm, and from the various cells came shouts and exclamations.

"What is it?"

"An earthquake!"

"Let us out of here! The building will come down!"

I pressed my face closer to the bars. "Elna," I said, "I do believe that Jelfel is going to unconsciously do us a good turn. If this trembling keeps up at this rate it won't be long before these walls and doors warp and crack under the strain. If that happens, stand by and I'll get you. I've got an idea, and it's a thousand to one it will work. Don't get out of touch whatever happens!"

"All right. Count on me."

The shaking increased until it reached a certain frequency, but of such an order that presently to my delighted eyes there appeared a gradual thin crack down the further wall of my cell. I watched it with a burning stare. It widened by imperceptible degrees. My whole body was trembling as though with ague from the constant dithering of the floor.

Almost as things apart I heard the clanging of cell doors, hoarse voices, stamping feet—a vast miscellany of noises with the lower undercurrent of the vibration running across the whole unintelligible din.

There was a sudden lurch and I found myself hurled against the door. A roar and crash from somewhere outside. Pressing my face against the grille I saw a massive piece of the corridor ceiling come crashing down in a cloud of dust, sending a nerve-cracking clangor, like a titanic hammer striking an empty boiler, echoing down the prison's dreary reaches.

I tried mentally to picture what was happening outside. The prison, I knew, was only one portion of the great Time Liner Building, and situated, luckily, on the ground floor. This being so, the prison would naturally be the first to suffer. If other buildings were being affected in the same way, New York must be on the verge of ruin. . . .

I did not have long to think, for presently that which I had hoped for took place! The door, unable to stand that constant and unremitting tremor snapped

at the lock and swung outwards, presently even trembling from the broken hinges. I could hardly keep my feet. Outside in the passage, as I stumbled into it, I beheld guards and prisoners alike scrambling to their feet on the vibrating floor, only to be hurled over again.

CLINGING to the trembling metal-work, I edged along to Elna's cell, next to mine, of course, and found her clutching the door-bars tenaciously. Furiously, I kicked at the lock, and at last, my foot aching from my efforts, I was rewarded. My repeated blows, and the force of constant vibration had been sufficient to break the metal clamp, and Elna came staggering out into my arms, hardly able to stand on her feet.

I hooked one arm around her waist, and with my free hand I hung on to what metal projections I could find.

"Keep together," I said in her ear. "I've got an idea."

We went away from the struggling, cursing figures on the floor towards the big arched doorways that led to the street levels. This necessitated negotiating three passages, but, so busy was everybody with their own safety, we were paid no attention to.

The entire edifice was filled with the most uproarious din, upon which was imprinted the frightful row of splitting and disintegrating metal, and the deep roar of Jelfel's hellish vibration system. Evidently, I thought, he had tuned his machinery so as to be at the exact periodicity necessary to cause the collapse of the particular metal of which practically all New York was composed. Evidently, during his trip to 2000, Jelfel had been very observant.

We gained the street without molestation, and there found the most indescribable confusion and disorder. Crowds of people were struggling des-

perately to keep their feet, the great majority failing. Remote-controlled cars were skidding and twisting sideways, hurling themselves into the midst of the shouting, terror-stricken mobs. Occasionally, great blocks of metal and stone from the towering edifices came crashing down in the street amidst clouds of dust and débris, crushing and maiming the unfortunates who happened to be beneath. . . .

"Confusion!" I whispered. "This is what we want! Elna, are you game to take a chance? Game to come into time with me and meet Jelfel on his own terms?"

Her face became filled with an eager anticipation, like the grand old warrior she was!

"Of course!" she answered promptly, pushing the hair back from her face as a rising wind, caused by the perturbation of atmospheric currents, blew it into her eyes. "I'm game enough, Sandy, but what do you propose to do? Everything is collapsing. Even if we dared to steal a time liner to travel in, it's doubtful if the metal hangar housing it is still standing. Everything is just dropping to pieces."

"Everything of *metal*!" I said quickly. "Carreno's time machine is the thing for us! Don't you realize that his laboratory—the museum—is preserved just as it used to be? It's made of wood and brick. It should have escaped the destruction of metal buildings for that very reason, unless such buildings have fallen upon it. Come on, let's make for it. We haven't a moment to lose."

We turned about, and bracing ourselves against the violent tremors and lashing wind, made our way down the congested, confused main street. I have little conception of how we successfully battled our way through the yelling figures, or how we managed to dodge the uncontrollable motor-cars and crash-

ing masses of masonry that fell ever and again. I only know that we did at last arrive bruised and exhausted in the little alley-way where the Carreno Museum was situated.

At this point of the city, it being the oldest part and mostly composed of brick and timber, after the old ideas, the vibration-force had done little harm, the reason being, of course, that the periodicity was not tuned to that particular form of matter. Jelfel, even as he had intimated, was concerned mainly with the formation of New York's bulk of buildings.

Without hesitation we climbed the fire-escape, which was dangerously loose in its supports; and smashed the window of the ground floor—the first floor up. The Museum was empty, even the Caretaker was missing, evidently driven out by the strange things happening within the city. To my intense relief, the time machine was still there, in exactly the same position in which it had been left the previous night. For a moment I wondered what the Caretaker must have thought when he had found it during the morning. There was no time for useless conjecture, however.

"In you get!" I said to Elna, and pushed her through the still open man-hole door. She stepped inside the machine with a calm courage, and I swung the ordinary propeller-motor (to raise us to the time line). After a few efforts the synthetic-fuel compressor worked and projected its contents into the firing cylinders. Instantly the engine burst into life amidst a cloud of blue exhaust. . . . And here may I add a point? The only way of keeping this time machine on the ground was by the gravitator-anchor, a rudimentary version of the idea that led eventually to those great magnetic plates capable of holding a time-liner. But for this anchor the vessel would always have floated in the

time-line. The anchor being used it necessitated an engine of some kind to raise this old-fashioned machine to the time-line itself . . .

To get inside, close the manhole door, and move to the control board was but the work of a moment. Setting the dial to the Age of Problems I threw in the various, archaic switches. Followed a jerk, a flashing glimpse of the four-dimensional landscape, then we were in the time-line and moving forward at our normal rate of 6 years to 1 minute.

I looked through the window, and to my mind there drifted another paradox. The view outside showed New York as *perfect*, and quite *unshattered* after we had left behind us that moment of chaos . . . I pondered upon that matter, feeling very small and unintellectual when faced with so profound a mystery.

CHAPTER VIII

Hurled Into Futurity!

ELNA aroused me from a profound preoccupation by a typical remark.

"Sandy, I suppose you know we've no food or water aboard?"

I turned to her. "I know it—but what could we do? There was no time for it, anyway."

"Then what do you propose to do? Exist on air?"

"The journey won't be so long in any case. We'll have to last out. My proposition is to go to the Age of Problems first and see if we can find a way through that etheric vibration. If we can't I'll stop the machine at your Age and we'll have a rest and nourishment; then we'll go on to the Age of Intelligence and ask their advice on the matter. Jelfel seems mighty sure that his Age is the only one worth calling intelligent, but I prefer to find that out for myself."

"But Sandy, if you go forward past his Age it will mean you're crossing that barrier of electricity he's hurling at the time line. We'll be blown to atoms."

"I don't think he'll be using his electricity for that purpose now," I answered thoughtfully. "So far as he knows there are no time machines coming along the time line now. He's quite convinced that he's stopped all that. And so he has—for the fact that we happen to be here is just an exception. Anyhow, I'm taking a chance. If I know anything of Jelfel, he has better uses for electricity than to waste it. Are you game to take that chance, or shall I drop you back into the comparative safety of the Middle Ages?"

She looked at me coldly and put her hands on her hips. "What do you take me for, Sandy? A mummy? Of course I'm coming with you. . . ." She relaxed and looked wistful for a moment. "I would have liked to have seen my father," she said sombrely.

"You know that can't be done," I answered quietly. "Every Age in precedence to Jelfel's—as far back as 2000—is being destroyed by his vibrator. We cannot enter those Ages without destruction."

She fell to pondering at that. Rarely did her quick mind accept the obvious; she was born of the spirit that penetrates beyond and solves.

"But," she said presently, slowly and thoughtfully, "if every Age is being destroyed simultaneously, how is it that in between we view Ages where the buildings are as solid and impregnable as ever? If indeed every Age from 2000 to 22000 is being destroyed simultaneously, it would mean a shattered world for something like twenty-two thousand years!"

"Time is, and ever will be, something always just beyond the grasp of mortal mind," I said solemnly. "I've spent years

navigating Time, and long ago I ceased to try and solve its intricacies. Explained geometrically, it is rather puzzling. Thus: Synchronism prevails only if a radius vector of one object is always parallel with the corresponding radius of another. Explained in more ordinary language, it is like this: Jelfel, by vibrating his machine into all the Ages from 2000 to 22000, is, in truth, veering away from that essential parallel of one radius corresponding with another. By doing that he has made a great mistake. During his activities, every Age is made to link with one present period of time—the period of time he is using—but the instant he stops to exert his powers, time resumes its normal course, and the Ages are as they ever were, because they come *after* the moment when he linked past with future. It is mathematically impossible to link past and present together for an indefinite length of time, and expect time past to take on the aspect of the future. It cannot bridge the intervening gap of what is called 'blank' time. Generally, there are two elements of time as we see it with our physical eyes, excluding all logic and natural reasoning. Those two elements are conscious, and sub-conscious time. The one—the former—is that which is before our eyes and true; the other is the less understood state wherein time and the activities of Nature continue to take place, dissociated from our state of perception."

Elna placed a hand on her brow and whistled. "You don't think I'm Einstein or Kant, do you?"

"It's not difficult!" I insisted. "Imagine a smooth flowing brook, carrying upon its surface a piece of wood. Now, take the banks of the brook as the different Ages. For convenience, we will say that trees are placed at equal distances along the brook banks—those we'll call Ages. Now, imagine your brook dammed at some point, yet with just enough outlet

in the dam to keep the water at a constant level without overflowing. What happens to your piece of wood? It stops opposite a tree, or, to show the analogy, time, to you, is made to stand still for a given period. From your standpoint on the piece of wood time is standing still, but all the same the course of time is going on—that is proved by the outlet in the dam which keep the water at a constant level. The instant the dam is removed you, on the piece of wood, will move on. But, whilst you were standing still, anything could happen in that Age. Cities could rise and fall without there being any appreciable movement of the time line—or brook. Yet, all the same, time has been going on. That is what Elna Jelfel is doing. By his methods he is making time stand still, but he forgets that once his influence is removed time will be as it has ever been. The whole thing lies in our state of perceiving it, which, from a human standpoint, is pretty feeble. Now do you see?"

"Well, I'll take your word for it," she smiled. "It must take a brain of hypertrophied dimensions to understand that clearly."

"It is not understood clearly by anybody," I assured her. "It is known what use time can be put to, but to understand it, is, it seems, the Almighty's prerogative."

She shrugged at that, but I was inclined to think that far more went into that keen brain of hers than was apparent on the surface. She said nothing further, however.

Crossing to the window, she stood for a space looking out on the kaleidoscopic upheaval of passing years, I, for my part, turned my attention to the instruments. Then presently Elna spoke to me again. I found that she had moved from the window, and was standing close to the controls, poring over a queer, circular cylinder, with two

pencils of metal, presumably copper, projecting from the top.

"What is it?" she asked, indicating it; and I recognized it as probably the lost accelerator for the controls. I went to her side and looked at it; looked also into an open box by its side which contained perhaps twenty-five of the copper pencils, for what purpose I did not then even guess.

I looked at it thoughtfully for a time, lying there on a small bench between the control board and automatic solar energy heaters. The cylinder was a trifle complicated, even to my expert eye, seeming nought but knobs and push-pull switches. Finally, determined to discover the thing's possibilities, and satisfy myself that it was the accelerator, I pushed in a large, bulbous looking knob in the centre of the thing.

Almost instantly a blinding blue-green flash leapt from the copper pencils on top of the thing, a flash of such brilliant intensity that Elna and I both fell back dazzled, covering our eyes with upflung arms. Simultaneously almost we were flung to the floor of the time machine by a sudden terrific forward surge. Try as we would, we could not raise ourselves from the terrific acceleration for quite a space. We just lay there, helplessly panting, feeling as though bands of iron were slowly crushing in our chests. . . . Then at last the frightful pressure began to relax, and I got shakily to my feet, practically dragging Elna to hers.

"What—what happened?" she asked, her eyes on the now dully glowing copper pencils.

"It is the accelerator!" I panted. "Lord, yes! Look!" I pointed out of the window to the cascading mysteries of hurtling Ages, and to the jerking, shooting sun. We were moving at a speed far and away greater than anything ever attained in my knowledge.

"Naturally, the sudden terrific accel-

eration threw us over," I went on. "So long as the acceleration kept on mounting we could not get up, but when at length we attained a constant velocity, such as it is now, we became normal again. . . ."

I went across and scanned the recording dials. I stared hard at what I saw and looked back at Elna again. "We're past the Age of Problems already! Heading into the future at top speed! This is a bit too much of a good thing!"

Feeling rather worried, I crossed over to the switches of the accelerator again, but to my growing horror found that no means I could devise would stop the infernal thing! I am inclined to believe, in the light of later happenings, that the extra propulsion was created by some form of atomic disintegration—the two copper pencils being used for the disintegration, and their energy transmitted into the interior mechanism. The whole system of both disintegration and atomic energy conversion, therefore, lay in the interior of the cylinder. Later I proved the truth of this. I was struck at the moment with a chilling fear that, if indeed these pencils of copper were used for disintegration, the accelerator would continue to operate until the last scrap of atomic energy had been exhausted! And heaven alone knew how long that would take!

"CAN'T you stop it?" Elna asked, a catch in her voice.

I pulled and tugged at the queer switches, kicked at the ebonite facing, did everything in my power—but no! We still hurtled through Time at a steady, terrific pace. I noticed that Elna was biting her lower lip agitatedly, nor did I blame her for feeling afraid. I was little better myself. I jumped across to the normal control board and pulled at the levers and braking switches with

the ferocity of a madman—but by some peculiar electrical linking the accelerator was mated to the control board, for it was impossible to use the switches without first stopping the accelerator.

I felt little beads of perspiration gather on my brow as I stared dazedly out of the window. We had passed the barrier line of the Ten Million mark, and were still hurtling into futurity at an undiminished, constant velocity.

Elna came to my side presently and joined me in dumb gazing. Already the vision of the landscape had changed. We caught glimpses of eternal wastes of sand, of a black, inimical sky, and occasional strange things that fluttered in a ghastly twilight.

Through the thousands of years we were hurtling, watching—dumb, helpless beings—the earth slowly come to the end of its life. And still we watched, fascinated . . .

Through the thousands of years we passed into the millions. Fifteen Million, Twenty Million, Thirty Million, and . . . Forty Million! Through the early facets of the earth's eventide we beheld little change beyond a strange cosmic spectacle—the vision of the moon increasing in size and sweeping ever closer through the awful gulfs of time and space towards the earth. Its transient, eerie light threw a pale radiance upon unthinkable desolations. Craggy hills rose evanescently against the changing almost black skyline, hills that were monstrous ridges of inkiness.

Once, something like a flying shark shot across our vision and was gone. Very slowly the earth was becoming older, until at last we were occupying a steady position on one point of the earth—or rather above one point of the earth. We saw that the sun had come to rest near the horizon, a glowing red ball bisected by the horizon. A ball sullen and friendless, almost burned out. The work

of solar, tidal drag was done. The earth had stopped revolving and was still, one face always to the sun, the other always eternal night. . . .

The moon, which during this period had been approaching ever closer, had vanished from view, but there was much in the sky—a sky of inky black—that led me to think that the satellite had broken up into the form of innumerable small particles, and had formed itself into an asteroidal belt, girt about the earth, like the rings of Saturn.

And still we went on, despite an occasional wrench at the instruments, and a dull feeling of growing despair. If Time was endless, where were we to end our astounding journey? How far would the disintegrating atomic force carry us before it expended itself? I glanced at the copper pencils—as yet only a quarter of their length had vanished.

A new aspect of the problem was commencing to worry me now. If this speed kept up we would ultimately come to a point where we would be adrift in space, with the earth no longer beneath us. Our only chance lay in the fact that Carreno's gaseous fourth-dimensional time-line extended through space itself. I saw no reason to doubt it if Time be endless. If, by some chance, it did *not*—if it was confined only to the earth—we would ultimately be flung into the void as a free body, to what end could not be computed. If the time band passed onwards into the void we would carry on until the gravitators anchored us to some other solid body converging with the time line; or else . . . I didn't dare to think further. Quietly I made my conclusions clear to Elna.

"Perhaps a quick death in the void would be preferable to starving to death," she said quietly. "For starve we shall if this atomic force goes on for a long time."

"Everything depends on the atomic

energy," I assented sombrely. "Fool that I was to ever tamper with it!" And in savage fury I kicked the base of the control board.

Presently, unable to control myself any longer, I made another attempt to stop that infernal accelerator. I studied with cold precision, I made calculations upon the possible time it would take to expend the atomic energy in a pencil of copper, a quarter of an inch thick and four inches long; I considered the velocity of the current used to disintegrate the copper, but here I was stumped, for I did not know the nature of the current. I pulled switches and pushed buttons, but never once hit on the correct combination. My efforts were as successful as those of a half-wit trying to stop a power-house. At last I desisted and admitted myself beaten.

Disconsolate, I went to the window again and put an arm around Elna's shoulders. We stood looking out once again upon that astounding vision.

"To think Jelfel has again escaped us!" I muttered direfully. "It's adding insult to injury!"

"There are more things to worry about than Elna's Jelfel," Elna answered quietly. "He can be attended to later—if we ever get the chance."

"True enough," I said in a low voice, and silence fell between us.

As the time machine traveled onwards a slow darkness began to envelop us, the cause being the gradual diminishment in the amount of light from the sun. There was much that led me to believe that during the middle of that journey we travelled at a most prodigious velocity, covering, I am certain, thousands of years to the minute.

All sparks of life had vanished from the earth at this unthinkable point in the future. Everywhere there lay as nought but a craggy, solidified hardness—and, very presently, we beheld a solidity ap-

pearing on the earth's surface, a solidity that reached upwards and all about us.

"Great Scott!" I ejaculated. "The atmosphere is freezing!"

I spoke the truth indeed. For quite a time afterwards we were enveloped in a dense white solidity that hid all vision, but of course, being separated from that dimension by the time line, we did not experience any discomfort. The solar heaters in the time machine—paradoxically enough using up the energy of a sun disappearing before our very eyes!—were functioning perfectly...

Then very gradually all this whiteness began to disappear, and we glimpsed the earth again, lying now a white-bound, ice-sheathed landscape, devoid of air, life and warmth. The faint light from the blood-red sun was rapidly waning, as we hurtled with incomputable speed through centuries upon centuries.

One thing now was obvious. Outside was the perfect vacuum of interstellar space, a temperature of minus two hundred and seventy-three point one degrees centigrade. The earth was a dead world—and yet the time machine was still going on! Proof enough that the gaseous fourth-dimensional time-line was independent of earthly conditions...

And still we went on, on surely the maddest, most incredible adventure ever meted out to two human beings! Still on, and ever on through the endless immensities of time. My mind reeled at the contemplation of the Eternal; the efforts of Man seem incredibly inadequate when placed in line with the Almighty's perspective.

CHAPTER IX

The Planet Brain

I HAVE no means of computing how much time we spent on our journey into incalculable futurity. It must have been quite a long spell, for we

suffered all the pangs of hunger and thirst before the copper pencils began to reveal that they were slowly coming to the end of their existence. Even so, our speed was still tremendous. Weary and aching, we dragged ourselves to the window and looked out again. During an interval—which had ended with our view of the airless earth and dying sun—we had slept. How long neither of us knew, but the sight that met our eyes when we came to look out again left us dumfounded.

For earth and sun had gone! Everywhere about us lay the intense, indescribable blackness of the void—above, below, on every side. Smudging this horizonless enormity was something misty, a nebulous swirling, only dimly visible to the unaided eye, and by far outshone by the brilliant, dazzling pinpoints of stars, and the lesser luminosity of strange, unknown planets. The time machine had become a space ship!

"What does it mean?" Elna asked, in a hushed, awe-stricken voice.

"Only one thing, Elna. We have gone so far into the future that the earth has dissolved into atoms; the sun has cooled, died, and done likewise—unless it has become a dark star which we can't see. Anyhow, the earth has crumbled into cosmic dust to form one day, who knows, the nucleus of another solar system. The inevitable law, Elna—birth, maturity, and decay. We are in the void, heaven knows at what period of time, amidst the stars and planets of a time beyond comprehension. See, over there we have the birth of a solar system—that flaming nebula, with the brilliant nucleus and rotating, less brilliant edges. And all about us, empty space. True indeed it is that Time is eternal. . . ."

"Does this mean we can never get back?" she asked quietly.

"Of course we can get back, granting

we stop this journey at a spot where there is solid matter. But if we don't use the accelerator to take us back, we will be dead before we even move a quarter of the journey. We'll be old!"

"What Age are we really in?" she asked me, and I turned to the dials and surveyed them closely in the starlight.

"Impossible to say, old girl," I replied, turning. "They have reached maximum and broken. The last reading was three hundred and twenty billion years."

"That's a long time," she said, with a trace of her old spirit, and forced a laugh.

I turned my eyes to the distant nebula and watched the slow movement of the unknown constellations as they changed their positions in the infinite, controlled by a power which, although science may claim to understand it, could not be reproduced by all the scientific genius ever evolved. The power of the Creator. I assure you that it was a solemn outlook.

The only consolation was that we were slowing down very, very gradually. The energy of those copper pencils was expending itself. After it had done so, if nothing solid merged beneath us, it would be a case of going on at the normal crawl until something did! I hardly felt inclined to dance with joy at that contemplation.

So our life went on for what must have been several days of normal time. We could only sleep, but, as time passed, even sleep became impossible, so torturing was our hunger and thirst. We were weak, cross-tempered, unutterably weary—almost at the point of wishing the damned time machine would blow itself up and drop us into the death-dealing void that enclosed us. . . .

And all this time the nebula we had sighted at the beginning was going through the inevitable cycles of cosmic

progress, until there came a time, as our copper pencils were nearly at vanishing point, when a solar system was born! This amazing spectacle we did manage to observe, and of all the astounding celestial things I ever saw, It was the most amazing.

Conceive it if you can! I realize the inadequacy of my pen. That spiraling nebula, now grown quite distinct in the firmament—the tremendous speed of its gyration. Then suddenly came the hurling forth of blazing, blinding fragments of light into the infinite! Seething fluctuations of eye-searing luminosity, that travelled outwards like the sparks from a child's catherine wheel. At our rate through time we watched the process speeded up, of course, and saw the invisible drag of the central nebula, as its gravity held the disrupted, flaming pieces, and very gradually drew them into orbits, until at last four boiling planets were moving at varying distances in ellipses around the parent sun. How long that process took I don't know. I only recall that we viewed the greater part of it at one sitting, and it will linger forever in my memory. . . .

After the birth of this solar system had taken place we again relapsed into a state bordering of semi-stupor, both of us incapable of speaking or moving; so utterly exhausted had we become.

We were unconscious of anything that happened for a long time afterwards, but at last I did manage to crawl about a little, and noticed that our speed had considerably diminished. The accelerator was no longer at work, but we were still being carried forward far beyond a normal rate by the tremendous momentum.

On hands and knees I dragged myself to the window and looked out; a choked cry escaped my broken and blistered lips.

"Elna! Elna!" I croaked huskily. "A

world! And we are materializing upon it! A planet from that solar system we saw being born. A world of steam and vapors—a young world, like what the earth once was. The orbit of the planet must have brought it so, that our time machine gravitator has anchored us to it during its travels around the sun. . . ."

With what little assistance I could muster, Elna managed to drag herself to the window and gazed out upon the landscape of seething mists and steam through which we were passing. Our view was perforce limited to this kind of vision for a long space, but as we passed age upon age we saw the gradual cooling off of this process, saw the formation of lakes and seas, saw titanic upheavals, as the expanding heat within the planet's core hurled up mighty mountain ranges and belched forth masses of volcanic matter. I am inclined to think the process was more rapid than upon the earth, this planet being of somewhat smaller dimensions, and naturally the smaller a body the less time it will take to cool.

YOU may imagine our astonishment, when this planet cooled down enough to support life, at beholding no form of life whatever—not active life, anyhow. We beheld merely a bluish-white sun and sea-green sky. And below a land of deep blue lakes and vivid green moss-like grass. A pleasant land indeed; but no sign of life.

I was too weak to make any remarks when we reached this stage. One thing was obvious, the time machine was now controllable again, since the accelerator had finished its dastardly work. Therefore I reached out my hand, pushed in the switch of the gravitator anchor, and tried to start the motor engine. Naturally, after the journey through space, it refused to respond. The result was that we fell out of the time line into

the mystery world with a resounding crash. Like a fool I had put on the full power of the gravitator-anchor.

I fell backwards against the wall, banging my head, but not severely enough to stun me. Poor Elna was unconscious in any case; the strain and complete exhaustion had proved too much for her at last. She was slumped at an odd angle in the corner, her arms sprawling wide apart, her body curled up—just as though she were dead.

Fumblingly, I felt around the screws of the manhole sheath. I knew only too well that the atmosphere outside might be poisonous to our type of life, but even if it was, death was preferable to this everlasting moving onwards through time. It was literally a case of life or death at that moment.

Then the air came whistling into the time machine. Just for an instant it caught my lungs and made me cough, but adapting myself to it was not a tremendous task. It was indeed very similar to earthly atmosphere, save perhaps that it had slightly more oxygen content.

Outside, lay a view of a small lake, and about it was clustered a bright green forest. The sunlight seemed tempting, and except for its heat and curiously dazzling light, it was not particularly unusual, being about the same distance—some ninety three million miles—as our sun is from the earth.

Feeling slightly revived by the fresher air I turned to Elna and shook her gently. She stirred slightly and turned a worn face upwards.

"What?" she muttered, between blistered lips.

"We've stopped, Elna. Stopped on the unknown world. There is water at hand. Come along."

She tried to get to her feet, but her legs crumpled beneath her. I doubt very much if, had she been on the earth in

that condition, she could have raised herself at all. This planet, due to its smaller size, had of course a lesser gravity, which, whilst imparting a pleasant lightness, did not make walking difficult.

"Come on, Elna," I murmured encouragingly, slipping my hands under her arms and raising her to her feet. "Water . . . You'll feel better. . . ."

With my support she managed to stagger along the soft, springy-textured moss towards the lake. Then I laid her on her face before it, threw myself down beside her, and tested its qualities.

"Fresh!" I breathed, smacking my lips. "Drink your fill."

She plunged her face into the shining coolness. The long draught we took revived us enormously. We were able to sit, able to stand, and contemplate our surroundings. And the sunlight, too, was pleasantly warming: almost too much so; it made us both feel unaccountably sleepy. This I attributed at first to hunger.

"Wonder if the forest holds anything edible?" I said, pointing to it. "Let's go."

I took her arm and we moved towards it, but at each step that tremendous lethargy increased. It was more than tiredness; it was pure hypnosis! It dulled our brains, dulled our faculties, bereft us of the power to reason. I have only one last memory—that of falling flat to the ground, and losing all conception of everything material!

* * *

MY return to consciousness was slow, but it was with a feeling that I was very comfortable in mind and body. I had entirely recovered from my former incapacitation; I no longer felt hungry or weary. Indeed, I felt amazingly strong, as though some unknown power had doubled the power of my muscles.

Opening my eyes, I became aware of

lying on my back under the shade of an overhanging rock. All about me were towering mountains, reaching green-sheathed slopes to pale green skies. I found Elna also just returning to consciousness beside me, and she too remarked upon the astounding strength that had come to her during the period of unconsciousness. Together we looked out over the unfamiliar landscape. It was certainly not the same place where we had fallen to the ground—indeed somewhere very far removed from it.

"Where's the time machine?" Elna asked suddenly.

That was a discomforting thought. The time machine was nowhere to be seen. With a mute accord we rose to our feet and looked about us.

"A planet of mystery indeed," I murmured. "Who moved us to this spot? How comes it that we see no signs of life? And again, how is it that we feel so well in health when before we were half dead?"

"Perhaps something to do with the sun," Elna said, glancing up at it under her hand.

"It's certainly conceivable that certain emanations from it might help our health a great deal, but even that couldn't explain our moving," I said, puzzled; then I suddenly staggered backwards as a profoundly deep bass voice spoke through the air, a voice such as I had never heard before. It came literally from the very bowels of the planet, of a depth so profound and vibrant that I could never have thought so bass a pitch existed in the realm of harmonics. One felt, rather than heard it.

"Stand still!" it commanded. "Be not afraid at what shall take place before you. Be patient!"

I looked at Elna's astounded face; the thing was real enough, then.

"That sepulchre voice," she muttered. "Did it really. . . ."

I nodded dumbly, then I almost jumped out of my skin at what took place on the stretch of level ground before us. A building had appeared as though my magic—a magnificent, many windowed edifice of white stone, and of considerable size. It appeared to be anchored to the ground by fine tendrils. Nor was this all, for a very earthly looking man came out of it, fine tendrils were draped to his form and attached to the ground. He came towards us like one in a trance, and stopped about six feet away.

"This is impossible!" I breathed dumb-foundedly.

At that, the tremendous voice spoke again:

"It is not impossible! You will follow this man to the white house, and be seated in the room he will direct to you. Do not touch anything unless instructed to do so; you are not mentally alert enough to understand the cosmic forces and areas of refracted space, that makes this seeming miracle possible. To tamper with it might destroy you, and I have no wish to be inimical. These manifestations are attached to the parent body—so watch, and hold your counsel. Now, follow the man."

In a complete daze, Elna and I did as we were bidden. The 'man' turned about and walked with a steady tread, and I noticed that it seemed as though the tendrils attached to him passed through the solid ground and vanished as he walked! The Voice's words, "attached to the parent body" obsessed my imagination. Little by little, the amazing truth was commencing to seep into my mind. The voice—the magical manifestations of the building and human being. . . Great heaven above! The planet itself was a living thing! Had an intelligence, of such indescribable power that we could not hope to glimpse the meaning of even its most childish efforts! Even as I

thought of this startling possibility, the words of the gaseous Martian in pre-history returned to me: "...a vision of a galaxy unknown; the movements of a planet as yet unborn, and your own visage visible upon that planet. There you will meet a power that will dwarf anything you have ever known, that will make our greatest efforts seem but the strugglings of an insect."

I remarked these thoughts to Elna, and an expression of profound wonderment came to her face. In silence we mounted the broad steps of the building—it was composed of a stone that had no earthly parallel—and were ushered by the mysterious individual into a broad, cool room equipped, curiously enough, with very comfortable easy chairs, and all the appointments of a modern flat of 2000.

I noticed that the manifested human always kept about six feet away from us, and never spoke. He was perfectly formed, dark haired and brown-eyed; indeed, in some odd way he was *too* perfect in formation. I began to suspect, and correctly as events proved, that he was only a manifested thought-image, created by the astounding intelligence that had us in its grip.

We seated ourselves, and waited for something to happen. With startling abruptness, the man vanished. One moment he was there; the next he had snapped into extinction. The room was empty. We felt a sense of vast, intellectual forces and presences grouping about us, preparing for communication with our little, uncomprehending minds. . . .

Presently the great Voice spoke again.

"My friends, I have studied you carefully in these past few moments, and have taken unto myself a complete knowledge of all you possess, both mentally and physically. You are both

extremely low in the scale of knowledge and perception, but by the same token are highly developed creatures of your own particular sphere. It would, however, be quite impossible for you to conceive any of the problems I would like to place before you, for the simple reason that you have not the faculties for understanding. You understand space and time, which is useful, yet you seem to have no conception of what is meant by Eternity, or what is meant by the term Universal Mind-Force. I am one unit in an inconceivably vast universe of colossal mind forces—forces of vibration, radiation, emission, hypnotism, and the entire area of the sub-conscious, which latter it appears you do not fully comprehend."

For a moment the Voice paused again, and then went on to mutter incomprehensible remarks about "fissure of Sylvius," "parietal lobe," "medulla," and so forth, all parts connected with a human brain, I realized. When, however, comments such as "trimagnetic rotating impulse," "outward force of space particles," and "constitution of emission cells," were uttered, I was hopelessly at sea.

"You must understand, my friends," the Voice went on again, "that you are now dealing with a mind force beyond the powers of anything you have so far experienced. Yet, I am not the quintessence of mentality by a long way. There are intelligences in the vast cosmic universe of such awe-inspiring force, that even I cannot grasp their smallest meanings! Mind—thought vibration—call it what you will, is an infinite power. It perpetually increases, until it reaches some ultimate force that no thing can understand. This ultimate force may be what is termed the Almighty! I am not in a position to say. What you must realize at this moment is that this entire planet is a brain. . . . A brain!"

CHAPTER X

The Return

"I THOUGHT so!" I said, half aloud, leaning slightly forward in rapt attention.

"In this exact position in space there once stood the earth, the planet from which you come. To your own perceptions that planet has ceased to be—yet you know in the innermost recesses of your mind that that world still flourishes. Why? Because you have merely gone such a distance along the time line as to lose all concept of that planet. This world you are on now is a child of the parent nebula, which you saw in space during your time transition. That nebula was nothing but *pure mind force*—not solid, unintelligent matter as was your earth. My reasoning leads me to believe that, at some unthinkable era in the past, a scientist set to work to make a brain. He was successful, but that brain became hypertrophied, lived and multiplied upon itself, reasoning higher each time, until it developed such intelligence that it wiped out its creator. From then on, age by age, it increased atom by atom, until at last it formed itself about the entire planet. Came the time when that planet, by Nature's law, collapsed into cosmic dust. Followed a period wherein it floated in space—a period corresponding to the time when your earth came into its brief life spell. After the death of the earth that cosmic dust, that had been a smudge in your own terrestrial heavens, condensed into a nebula—a flaming nebula of intelligence. That nebula was the one you saw during your time travelling. And so it came to pass that the intelligent sun gave birth to its intelligent children—this planet, and three others. So you perceive the coming of a planet-intellect, of immense and far reaching power. Apparently just an ordinary world with water, hills, and land-

scape, but intelligent none the less. Hence a power to which the concept of time and space, the practical application of every dimension, the knowledge of every atom and molecule, is but a child's problem. . . ."

I felt strangely wedged between gigantic forces. Elna, I imagined, from her expression, felt the same way. She was sitting quite still, listening in utter silence to every word. Long since had we ceased to conjecture where that bass voice came from.

"You have yet to learn that the need for sustenance in the form of food and water is unnecessary," the Voice continued steadily. "When you reached this planet you immediately partook of water. You felt better. Why? Because you *thought* you felt better! Had you fully believed you would have felt worse, you would have got the physical result of that belief. The physical, my friends, always reflects the mental. I threw you both into a state of hypnotism, and whilst in that condition brought you back to a normal condition merely by altering your thought perception. In the same manner you were transported, in a 'blank trance' to a more convenient spot for communication, but as your minds are adapted to material things I willed this house and the human being to appear, so that you might be more comfortable."

"We are indeed grateful," I said, feeling something was called for.

"It is nothing, my friend. I also perceive that you came to this time through no apparent fault of your own. Your real desire was—and is—to overthrow one warlike specimen in an earthly time known as the Age of Problems." The Voice became cynical. "Age of Problems! I can see every mystery solved in that Age even now! . . . I notice also that your motives are for the right thing—to perpetuate good on the earth. Right is the only correct reasoning; if you

would succeed, my friends, I am minded to help you..."

"In what way?" I ventured.

"I have made an examination of your respective brains, and, whilst they are small, and singularly incapable, I can nevertheless convert them into such high-powered organisms that very few problems of your planet will baffle you. The mysteries of Elnek Jelfel's Age of Problems will no longer trouble you... You will be able to save the earth—for there is every need of it, believe me. Elnek Jelfel is not what you think he is!"

"Why, what is he?" I asked quickly.

"That you will find for yourself in time, my friend. Believe it true that the earth is in dire need of your assistance, and I shall make you capable of giving that assistance. . . . The brains of yourself and of this young woman are merely a mass of multitudinous nerve cells and fibres—in embryonic formation compared to mine. Each of those cells responds through chemical changes to some form of external energy. To descend very low in analogy, you must imagine that the impulses are akin to the conduction of electricity in a wire—only in your case mental impulse is a great deal slower than electricity. When this impulse reaches a nerve cell of your brain that cell liberates energy, and this energy is transmitted to other cells. The cells which are needed, be they muscular or nervous system, immediately respond to life. In the former case, the impulse will of course be transmitted to the contractile cells, and in the latter to the neurones. You understand that?"

"In a way," I said.

"Since the greatest brain activity takes place around the region of the cerebrum, and since the speed of impulse to the nerve cells is so slow, it is my intention to so alter the cerebrum in your brains that your powers of perception and retention will be greatly increased, and

also I shall remove from the cells a great deal of needless material, which will mean, to you, greatly increased intellect. In time the effect will fade, and you will become normal, due to the fresh clogging of the cells. But my reasoning tells me that your clarity of thought will last long enough for you to outwit your enemy."

For some reason, sudden fear clutched at my heart. Elna gripped my arm and looked at me in alarm.

"But surely we will do as we are?" I panted, horrified at the plans of this all-powerful intellect.

"You have nothing to fear," the Voice responded. "The operation will take place immediately."

We both jumped to our feet, but before we could make a move three white-garbed men emerged from the air and walked steadily towards us, those queer fibres extending down into the marble floor as they walked.

"Obey!" the Voice commanded.

We had no alternative. That hypnotic mind had us in its grip again. We made a last desperate stand against it, fought with every vestige of our puny will-power, and failed. I dimly remember being lifted into the air by some invisible process and floating down the long hall, Elna by my side in a like position, and the three silent conceptions of a super-mind following with a steady tread in the rear....

MY sensations during what I correctly presumed was the operation—performed by the three automata surgeons under the mighty mind's control—were amazing in the extreme. There was no pain or discomfort; I seemed just to be comfortably asleep, and yet, in some unaccountable way, awake. I could see everything with my eyes shut! Could see the white-garbed surgeons working under a brilliant light, which

had, I fancy, some radium content in it, and glimpsed the occasional glitter from electric knives and marvelous surgical implements that put anything, I had ever seen before, completely in the shade. I think Elna was somewhere near me; I could not be sure.

As the process went on I felt queer little impulses in my head—impulses that I can only liken to little hammers beating in my skull. And for each beat, it seemed, my sense of imagination and sensation increased. I found that I could still not only see with my eyes shut, but I could even see through the walls of the room; and through the floor and ceiling! Just like glass—the green heavens above, and the utter blackness of void beneath. For an instant a terrifying dizziness and nausea seized me, and passed. I felt for a space as though I were floating like a disembodied spirit between the real and the extramundane. . . . Then I awoke!

I became conscious of a strong arm about my shoulders, and of an expressionless face looking into mine. I felt very strong, astoundingly strong—the exact antithesis of the close of an earthly operation. Also unlike the sequence of an earthly operation, I got off the operating table of my own accord and gained my feet, flexing my arms, and feeling a sudden desire to hurl things right and left. . . . Then the mood of transient savagery passed. I turned about and saw Elna being helped to the floor by the third surgeon.

Little by little, as I stood there, I began to feel the effects of the operation, so marvelously and painlessly performed. At the first my sensations were normal, then I began to sense matters take on a change. At will I could, in a sense, become as though possessed with X-ray eyesight. By a slight effort of concentration I could change my normal vision and see right through any object, in the

same manner as I had done whilst on the operating table. I looked at the surgeon before me and felt a passing phase of amazement at seeing the skeleton formation of his body through his clothes and flesh. Then I ceased to concentrate, and, to my vision, he became a solid man again.

As I was pondering upon what next to do, the surgeons vanished. The tables also melted, and the instruments. The entire operating-theatre was empty, save for Elna and me. I went across to her and laid an arm about her shoulders.

"How do you feel?" I breathed, and learned that her sensations were very similar to mine, only in a slightly lesser degree, probably because of her smaller proportions.

"The operation is ended," said the Voice. "In time, as I have already told you, the effect will pass, due to fresh clogging of the cells; but now you are equipped with the power to fight for the good of your planet. Make notes whilst in this high stage of mentality, so that problems which baffle you may still be solved when you return to normal."*

"Will our state of perception increase as time goes on until the zenith is reached, or will it decrease from this standpoint?" I asked.

"It will increase for quite a time yet. As new problems rise up you will exert your mentality to overcome them. Exercise of anything is the only key to its practical use. Stagnation is anathema to a brain, as it is to anything else. You will reach a certain peak of mental perfection, then gradually you will drop back. There will be times when your brain will think faster than your body will move. You will do and say unpremeditated things. But do not worry; a brain always works for the good of the body. You will never regret these im-

* This I did, otherwise I could never have written down my various mental gymnastics, S. L.

pulses. . . . And now, before I bid you farewell, is there anything more you wish to know?"

"Yes," I said. "Is there any way we can speed up our time machine in order to return in reasonable time to our own Age and world?"

It seemed that the brain planet laughed.

"I did not arrange for your brain to be operated upon for nothing. That problem will not baffle you when you see your time machine again. I will transport you to it, and that must end our communication. If ever you come far enough along the time line again to seek my counsel, I shall always be ready to give it. Good bye."

The Voice ceased to speak; came a sudden wave of giddiness. I seemed to reel helplessly, then I was standing not ten yards from the silent, motionless time machine with Elna at my side, as usual.

"She looked about her, and remarked, 'We're back again where we first landed.'"

I nodded. "Now evidently comes the time when we must exert these 'speeded-up' brains of ours and see what we can do. Let's get inside the machine and think it over."

We walked slowly towards the one link with our Age and planet, and as we did so I turned the matter over in my mind. I had hardly started to think the problem out, when like a flash of light the solution came to me. I stood astonished, amazed to think that I could ever have been so dense as to not see it before. I felt like a child who has been unable to open a door by pushing it, and had suddenly found it opened inwards instead. I laughed with the sheer joy of mental accomplishment.

"Yes, it's easy enough," Elna nodded, as I turned my delighted face towards her. "I can see the solution as well. What dunderheads we've been! All that

is needed is to use those 'refill' copper pencils in the accelerator cylinder, set the electric disrupter at work, and the rest is automatic. Let's look."

Eagerly we went inside the machine, and amazingly enough, without the least effort, found how to open that cylinder which had formerly defied all our efforts. Inside were the controls for the disintegration of the copper pencils, and the neat little apparatus for converting that tremendous energy into propulsion. Silently, comprehending everything as we looked, we surveyed the neat, gleaming pistons of the propulsor shafts, and saw too the complicated connections that mated the whole thing to the master control board.

I looked again at the box at the side holding the twenty-five copper pencil refills, and placed two in the sockets on the top of the cylinder.

"And of course," I said, looking the thing over again, "this switch here starts the motor, but you can't stop it without throwing in this break-contact plunger. We failed to understand that the only way to stop the constant disintegration was by using this plunger, which, coming into contact with this magnetized plate, throws out a radius of pure energy of exactly the right frequency necessary to stop further atomic disintegration. We pushed the wrong knobs. It never occurred to us that this thing was on the plunger principle. Beats me how we were fooled by it!"

Elna smiled faintly. "What is past is done with, Sandy. We're going back home as geniuses, and we're going to wipe Jelfel off the map before we've done. . . ." She stopped and frowned in sudden annoyance. "No food or water during the return journey!" she snapped. "What fools we've been to overlook it. I don't want to go all through that misery again—" Here she stopped dead and stared at something on the floor. So

intent was her gaze I looked too, and can you imagine my feelings at beholding a hamper standing there, lidless, and filled to the brim with the choicest viands of earthly Ages. We went closer and found upon the handle a very earthly looking label, with words printed by some marvelously flawless machine:

"A PARTING REMEMBRANCE
TO THE EARTHLINGS."

"The Voice has given us food," Elna said, needlessly, looking at me in rather an awe-stricken manner. "What a mind—what conception.... Oh, look here! A chicken, perfectly cooked—and champagne—and ekrimar! Truly nothing is impossible to a mind that understands what to us is impossible." She paused and smiled drily. "Looks to me, Sandy, as though we'd better get lost in Time again!"

WHILE Elna attended to the accelerator, I set to work upon the controls—after the air lock had been securely fastened, and that precious hamper removed to a safe corner. I got the machine rising on a long slope into the air, (it appeared that the motor was working perfectly again after its travels through the void, either through the warmth of the sun, or else further work of that astounding planet brain), and presently we impinged upon the time line with a slight jar, seeing once again that familiar four-dimensioned view. Then once more we were firmly imbedded in the time line, hurtling backwards along that endless stream to our own position in space and time.

For the time being there was nothing more to do, so we set to work on perhaps the most delicious meal I have ever known. Chicken and ekrimar! I live again those moments of palate paradise.

Certainly there was no discomfort on

the return journey. We saw, of course, that amazing planet brain in the reverse order of time. We saw it return to the parent nebula, and recede until it again became that dim smudge from which it had evolved. Once more we passed through the incomprehensible gulfs of infinite space, until at last the earth began to re-form below us.

Backwards we went, and still further backwards, through the countless centuries. Through the age of frozen air, the age of ice, the earth's last days, and still back, and ever back. The journey took, I noticed, practically the same time as before—but without its attendant discomforts.

Came the time at last when the sun resumed its golden tint, when it again swung with terrific velocity; when at last the moon swept through all her phases in a violet sky. At this point Elna threw in the plunger of the accelerator, and instantly the copper pencils ceased to liberate their disintegrating energy. Our speed began to slow down. The Age of Safety, the Age of Danger, the Age of Security—all moved before our vision in running, turbulent panoramas of four-dimensioned incredibility. . . .

And so at last to the Age of Problems once again!

Here we halted the time machine almost to stopping point, and considered the best course to adopt. The Age was, of course, shielded by etheric vibration, through which nothing solid could pass. To attempt it would mean immediate repulsion. The only thing to do was to consider the matter very carefully. We now had superior brain force; here was the chance to test its powers.

By mutual assent we sat down and thought it out, and very amazing it was how fast our ideas flowed.

"It's simple!" I exclaimed at last,

and once more experienced that amazement at being so little-minded before. "This atomic disintegrator, which we use for the accelerator, can now be dispensed with. We will increase the field of disruptive force and turn it *on Jelfel's vibration screen!* That will disrupt the atoms of the vibration screen and allow a clear passage for the time machine. Easy!"

"How do you propose increasing the field of disruptive force?" Elna asked.

"Not difficult. The heaters work from solar energy—stored solar energy. The pressure-gauges show we've an enormous amount of surplus solar energy still in store. Dismantle the heaters and convert the energy into the energy already in existence in the disintegrator. Release all our surplus energy at one go—and whoof! Bang goes Jelfel's precious obstacle! Some of it at least—enough for us."

We set to work right away. First we dismantled the accelerator and set it up in the nose of the time machine. The next task was to connect the flexible leads of the disrupter to the exact centre of the ship's metal nose, and so allow the current to pass into the exterior of the ship. The task of rivetting the cables and fusing them through the metal itself we accomplished with that very useful heater. By stepping it up in power and choosing one particular degree of heat, we managed to obtain enough brief incandescence to fuse the cable into the metal... Next we set to work to remove all the surplus ebonite casings we could find, and put them on one side to be used for encasing the motor when finished, and so stop, as much as possible, the spread of dangerous electric discharges. . . .

The arrangement of the heater was not particularly difficult to our amazingly clear minds. Between us, we found it

fairly simple to attach the solar-energy converter to the one in the accelerator, and arrange the cables to stand the load of considerable extra voltage from the stored solar-energy. True, we equipped the motor with resistances to avoid the chance of burning it out by overload.

The rest of the work was simple. Without any trepidation, so confident were we of the correctness of our plans, we switched on the storage batteries of solar energy—taking care first, of course, that the whole apparatus was shut in with ebonite so far as we could manage.

What took place was exactly as we had calculated. The stream of disintegrating force was transmitted into the air outside. That field of disruption struck the shield about the Age of Problems almost immediately, and there was a sudden blue-white flare that nearly blinded us with its terrific effulgence.

"Quick!" Elna breathed tensely. "Forward! We're blasting the way through!"

I flung in the control switch, set my teeth, and drove the time machine through the white hot gap. I made the jump with terrific velocity in order to avoid the melting of the ship itself, so terrific was the heat. Then, at my order, Elna cut off the disintegrator's power, for already it was cutting a hole in the ground itself!

The time machine staggered slightly as I swung it sideways out of the time line, lurched, and then started to fall downwards. In a moment I had the normal engines going and arrested our fall. I felt my heart beating with delight and excitement as I beheld below the familiar round, wheeled buildings of Jelfel's Age, glittering and gleaming in the dying sunset.

Lower we dropped, and lower, until at last with a thud we came to rest a trifle to the left of the city.

CHAPTER XI

Outwitted!

AS we descended from the time machine, the lights of the city suddenly sprang into being, as though in salutation of our arrival, I reflected. Instantly the machine city became a wilderness of gleaming, bellying edifices, the lights within them shining through the windows, and turning them into square eyes.

Elna came to me, and together we looked up in silence at the Emanation Towers of the etheric barrier. A cold smile touched her lips.

"That didn't prove so much good!" she said drily.

"Nor is that anything to what is going to happen," I supplemented; then before I could say anything further a quartet of men padded silently up in the arc-light. I turned with a little start, my eyes dropping to their levelled ray-guns.

"What are you doing here?" one of them asked, evidently the leader judging by the array of badges adorning his chest.

Somehow, my extra fast mentality flung the next words into my mouth.

"We seek Elnak Jelkel, the Master."

He looked at us suspiciously for a moment, then cocked his eye on the time machine.

"That's a time machine, isn't it?"

"Yes. What of it?"

"Just this. How did you get through that vibration screen?"

I smiled a trifle grimly. "I don't consider myself answerable to a guard," I replied. "Take me to the Master at once."

For an instant the guard looked at me with more than a hint of fury; then he relaxed and shrugged his broad shoulders. "All right. Follow me."

He turned about and we followed him between the wheeled edifices. His walk

brought him, as Elna and I had expected, to the door at the base of the observation tower. We were led in, the door closed, and there followed a march across the familiar, smooth expanse of floor. At the footsteps, a slight figure at the far end of the room turned and looked up from surveying his banks of instruments and dials.

It was Jelfel, of course. Nor could he conceal the astonishment in his features as he gazed at Elna and me. With a curt nod he dismissed the guard, and came towards us with a face that slowly became impassive once more.

"This is a surprise, Commander Lee—Miss Folsom."

I looked at him, and felt, for the first time in my experience, capable of overshadowing him in intellectual force. Even his many complicated instruments no longer baffled me.

"I thought you'd find our visit a trifle unexpected" I responded coldly. "You see, Jelfel, neither your efforts to maroon us in prehistory, or the powers of your vibration screen served to keep Miss Folsom and me out of your plans."

"You interest me. Tell me, Commander, how did you ever get through that vibration screen? There must be a fault in it somewhere."

"No there isn't, Jelfel. We literally burned our way through it. We disrupted your screen. It's composed of vibration forces set up in the nitrogen atoms, isn't it?"

"True enough. But—"

"The disintegrator we used has a radium content. We merely shattered your nitrogen atoms—and incidently your screen—with alpha particles of radium, allied with solar energy."

Jelfel stroked his chin. "Then of course the atoms were transformed into hydrogen atoms?"

"Yes, but that was of no consequence to us. We broke your screen and got

through, anyhow. I claim no credit for the idea. Nitrogen atoms were exploded by radium particles thousands of years ago. This was merely an improved version, aided by stored solar energy."

"A feat like that, Commander, must have taken a power of reasoning I hardly suspected you possessed," Jelfel remarked drily.

"That is but a trifle compared to what I am going to do later," I returned grimly. "You may as well realize right away that both Miss Folson and myself are here to exterminate both you and your machines—and all the machines you may devise to block our path will avail you nothing!"

He raised one eyebrow half amusedly. "Really, Commander? Well, I'm sure that is very interesting. You are delightfully frank—the one really interesting trait in your other-wise diverse character. . . . Of course, though, what you say is so much absurdity, for the simple reason that I have you covered at this very moment with magnetic poles which can produce instantaneous paralysis. Just try and move," he suggested coaxingly.

I did try, and cursed myself inwardly for a precipitate fool. I could not shift an eighth of an inch from where I was standing on the metal floor. "Neither could Elna move.

VERY rash, Commander—very rash," Jelfel murmured pleasantly. "However, it may be of interest to you to know that my plans are working splendidly. All the cities of the Ages from 2000 to this Age are in ruins. Every time liner has been blown clean to hell, and the Presidents Templeton and Folson are both quite dead! My machines fully recorded all I needed to know from the still retentive brains of the dead men; then they were rayed out of existence. Time machines are now being rapidly built. This Age, as I have told

you before, is overcrowded. Daily it becomes worse."

"Yes, so you've said before," I returned tartly. "I don't believe that stuff. You've got bigger schemes up your sleeve, and I mean to find out what they are!"

"You mean that you have killed my father?" Elna put in, in a low, tense voice.

Jelfel smiled twistedly as he looked at her. "You know, Miss Folson, there is a very old saying—'All is fair in love and war.' This, of course, is war!" he added, with entirely needless emphasis.

I looked at him steadily.

"So you succeeded in wrecking every civilized city with that infernal vibrator of yours?"

"Exactly, Commander. It was an interesting sight, viewed in my Wave Trap, to see the poor fools scuttling like rats for shelter as the buildings fell about them." Jelfel brooded for a moment and clenched a thin hand ruthlessly.

I stared at him in bleak hate for an instant; then suddenly I summoned every vestige of my abnormal will-power in an effort to break the magnetic bonds that held me. He was too goading; more than flesh and blood could stand. . . . The strain was terrific, and the first time it failed. But the second time I succeeded!

So sudden was the breakage of magnetism, I toppled forward clean on top of the thoroughly astounded Jelfel. I think it was not so much the mental effort I made as the physical one. That titanic strength that had come to me aided me enormously. I closed my hand about Jelfel's throat in a grip of iron. He struggled feebly, rage contorting his features. I forced him to his knees.

"Now!" I breathed exultantly. "I've got you where I've wanted you for many a long day! You are going to give immediate orders for the stopping of all time-machine building; then you are go-

ing to tell me your real motive behind all this. I'll decide later what plans to make. You smashed all those cities in the time line, for instance, and you're going to rebuild them. Understand?"

"And the alternative?" he choked, clawing at my hand.

"This," I said in a low voice, and crushed my fingers with almost frightening power into the soft flesh of his neck. At that he fought frantically, and I eased off a trifle. "Well?" I asked. "You have ten seconds."

He seemed to think swiftly. Then, gurglingly: "I agree."

I let him up, covering him with the ray gun I snatched from his belt.

"First of all, release Elna," I ordered.

He reached out with his foot, moved a control on the floor, and Elna came forward to my side.

"The communicator to your workshops is over in the corner," I said, not stopping to comprehend how I knew all this. "Give those orders for stoppage immediately."

Jelfel looked at me strangely, as though uncertain as to how much I knew, then with a curious little smile he walked over to the instrument in question and made a few adjustments to the mechanism. I watched him narrowly.

"No tricks," I advised him. "I happen to know far more than you realize, Jelfel. My mind is quicker than yours. This is war of wits and speed—not of blood."

"True," he assented with a little shrug; then with astounding swiftness he suddenly flung out his right arm and knocked the ray gun clean out of my hand. Another swift movement, which I recognized as a ramification of the ancient art of ju-jitsu, and I found myself lying on my back on the floor with all the wind temporarily knocked out of me. Automatically I kicked out my foot and struck him full in the stomach.

Rather to my surprise he was not winded in the least. He merely staggered, and I noticed that my foot had brought forth from his middle a curious metallic sound. I had no time then to conjecture on this curious occurrence, but later I had great reason to remember it.

I scrambled to my feet as he staggered, retracting my arm for a punch that would certainly have cracked his jaw had it ever landed. It never did so, however.

"Stand still—both of you!"

Both Elna and I stopped dead in a forward movement. The cold-faced guard who had escorted us from the outside was now standing in a further doorway, ray-gun levelled. He advanced with a glint in his eye.

I dropped my arm and waited grimly for the next. Jelfel recovered his balance and stood in silence by the bench for a moment, his green eyes upon me.

"So!" he panted at last. "You thought, by primitive methods, to outwit me, Lee? You consummate fool! Your brain greater than mine! Bah! You have not the brain of an ape to descend to that sort of foolery. Barbarism died out in the atomic war of 2468; after that it became pure mind-war if there was any at all. But you're going to pay for that lapse. You hear me? You are going to—pay!" He spat out the word with vicious satisfaction, and came closer to me. "Death is too pleasant and swift a passing for so worthy an enemy. It must be something lasting; something to carry in the memory. . . ."

HE began to pace up and down, chin sunk on his chest, hands clasped behind him. I followed his every movement with burning eyes, wondering in my innermost mind what conceivable notion had ever prompted me to be so utterly ridiculous in my behavior. Nat-

urally, I might have known I could never hope to overcome a man like Jelfel by mere barbaric methods. Still, I had obeyed a mental impulse and felt vaguely satisfied.

Presently he ceased his pacing and came towards Elna and me with a slightly sardonic smile on his cold face.

"I have a wonderful idea," he said softly. "An idea worthy of a genius—and also an idea that will give you ample scope to exert your—er—super-brain. Correct me, Commander, if I have designated your intelligence erroneously."

"You infernal—" I began; then I stopped hopelessly. He went on monotonously.

"Undoubtedly the best place for you and Miss Folson is in the Machine Department. There, despite a certain amount of rigorous confinement, you will have ample scope for exerting all the intellect you desire. You will be able to help in the actual making of my time machines! You will be able to help with the assembling of them. In brief, you will be able to help in the construction of the machines, the secret of which I obtained from the brains of two dead men. One your father, Miss Folson!" He turned to her, his icy smile broadening into an unholy grin.

I said nothing; neither did Elna. What could we say? I assure you it was only a remarkable effort of will power that prevented me hurling myself again on this scoundrel of the Age of Problems.

"Naturally," he went on calmly, "the time will come when the constant toil, the privations, and the iron rule I enforce, will break you. You are a strong man, Commander Lee, and Miss Folson is anything but lacking in physical endurance. But even so, the strongest body and mind break under perpetual hardships. That is what happens in the Machine Department, my friends. The

workers there are really criminals—prisoners—but naturally it is my desire that they perform useful service whilst being punished at the same time. They die in the end, so what matters it?"

Again came that involuntary action that made me utter words entirely apart from anything preconceived.

"If you only knew it, Jelfel, you are signing your own death warrant by sending us to the Machine Department you speak of. Elna and I returned to wipe you out—and nothing you can do or say will ever alter our purpose. It is written in Time that it shall come to pass."

Jelfel shrugged.

"I have an intense appreciation of the melodramatic, Commander, but I usually like it in the proper place, where the general perspective lends itself to the atmosphere of the drama. You, to use a vulgarism, are merely drivelling." He stopped and looked at me with his burning eyes for a moment, then turning to the instrument board behind him he pushed in the switch of the Light-Wave Trap. Instantly the attached ground glass screen flared into life, and there came a vision of the arc lit world outside. Swiftly, as Jelfel operated the controls, the view changed, until at last Elna and I beheld our time machine clearly in view in the picture.

"That, of course, is the time machine in which you came?" Jelfel said, without turning his head.

"What about it?" I snapped.

"Sorry though I am to state it, Commander, it will have to be destroyed forthwith."

"Destroyed!" I breathed thickly. "You're marooning us again, eh?"

"It is really necessary, Commander. You remember when I destroyed Liner 48? Well, this machine will go in the same way. The only difference will be that I shall use a Disintegrator, instead of the beam of force, such as I used be-

fore. They are both similar in ultimate results."

He moved to his Disintegrator, threw in the switches amidst a flaring of electricity, and then stared at the screen... Came one brilliant flash and the time machine had completely vanished. There remained only a smoking patch upon the dry ground.

Dully I heard the contact being broken on the devilish machine, and looked round again to behold Jelfel complacently smiling.

"Just—dust!" he said pleasantly, switching off the Light-Wave Trap with a slender, skillful hand.

I felt unable to speak in the intensity of the moment. I only comprehended in a dazed kind of fashion that the link with my own time—with Elna's time also—had been ruthlessly destroyed. The only other way was with Jelfel's own time machines, and as for getting a chance with one of those! The farcical

side of the idea almost prompted me to a bitter laugh.

"And now, my friends," Jelfel went on, "I will personally conduct you to the Machine Department. I feel sure you will feel honored," he added, with that cutting sarcasm that was the grim shield of his cruel, merciless nature. "Pray come with me."

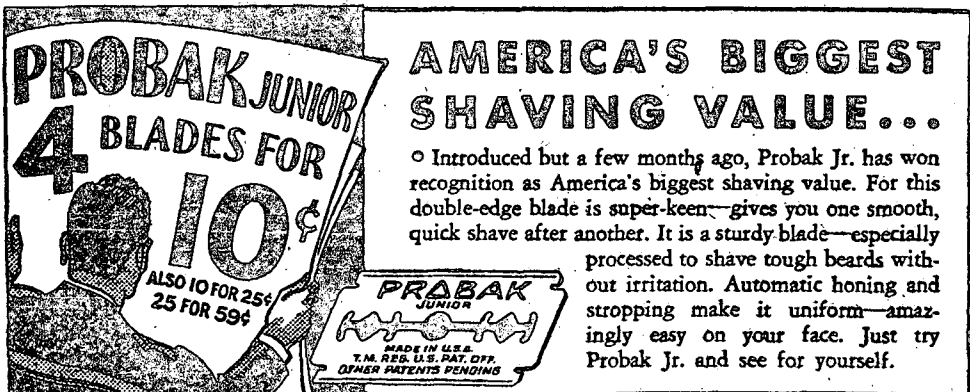
He turned about, and I watched his slender form for a moment; then, at a jab in the back from the guard's ray gun, I proceeded to follow him, Elna walking at my side with footsteps that were noticeably weary, not so much from physical exhaustion as mental hopelessness. True enough, the position at that moment did not seem to warrant any overflow of joy. For some reason then incomprehensible, I had walked right into a trap, and had dragged Elna down as well. Silently I felt the pangs of remorse, and above all a seething fury against myself.

END OF PART II

In Our Next Issue:

Harl Vincent's next contribution to our pages will be—

PARASITE



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Moon of Arcturus

By RICHARD TOOKER

This is distinctively a tale of the future and the author has woven quite an enthralling story of long distant days yet to come when voyages in outer space among the stars will be an every-day occurrence.

CHAPTER I

The Call from the Void

IT is true nevertheless," insisted the compurion, emotionlessly, his abnormally large head, resting in withered hands, resembling a curious, oracular idol in the act of prophecy. "The messages were received by two sets of improved visual detectors, not once, but for nearly an hour of almost unbroken repetition. As to the origin of such impulses in the cosmic rays, there can be no question. Ethereal static could not have caused them."

"You mean to say, compurion, that my daughter, Alois, actually has landed on an aggregation of matter beyond the farthest we have explored with our most powerful space-ships?"

Commissioner Brest Frontenac was incredulous. His beardless face, that revealed so little trace of his three hundred and seventy years of public life, had been imbued with an expression of amazed delight. More than a decade before, Alois Frontenac, his only daughter, and far-famed Terran beauty, had been reported lost among the seventy passengers of the ill-fated atomic space-liner, *Bridge of the Abyss*, which had crashed with a meteor a few thousand miles off Venus. And now, this news of her survival came as a greater miracle than even miracle-making science could conjure in that year 14970 A. D., when men could live as long as they liked and

travel was speeded to almost the velocity of thought by the completely revolutionary discovery of *tysnaldine*, the energy of disrupted, completely annihilated carbon atoms.

"Yes, Commissioner Frontenac," the compurion nodded positively; and when one of the big-headed, big-brained compurions spoke positively there was no recourse to interrogation. These especially trained, especially bred mechanic-thinkers, seldom if ever erred in the conclusions. "The signals of distress from your marooned daughter have established a new record for the cosmic ray pulsators."

"Repeat them again—please." The commissioner had all the enthusiasm of youth for all his three hundred and seventy winters, and fifteen gland replacements.

"4-9-Q-7-7-S-V-O-8-9-9-0-0," repeated the compurion mechanically, and the commissioner, translating the code of the interspacial messages, read:

"*Arcturus—moon—Alois F.—Bridge of the Abyss.*"

The compurion waited expressionlessly while the commissioner repeated the message over and over again in unconcealed delight. Then, at a wave of his hand, the machine-man abruptly arose and departed without ceremony, his movements made doubly swift by a belt-like device at the waist, which partially neutralized gravitation at the will of the pedestrian.



*Halfway to the still figure of the woman that was watching them,
Hillard's stride faltered and broke.*

A moment after the compurion had gone the commissioner turned with fumbling fingers to a large, intricate television board—the telephone of the Miracle Age. He adjusted the dials swiftly, for all his nervousness, and a strong, young face suddenly glowed upon the visual disc. As if addressing the man in his presence, the commissioner spoke into the microphone, watching the expression of the televised image. His own face, the commissioner knew, was likewise projected for the benefit of those to whom he spoke.

"So you do not believe me, Drake?" Frontenac was saying.

"How can I?" returned the other in an astonishment that seemed tinged with suspicion of the older man's sanity.

"But it is true! The compurion has just departed from his report of the miracle."

"ARCTURUS, you say?" the voice of the younger man was hoarse with growing intensity of interest and conviction. "But it's only a molten, nearly gaseous star."

Commissioner Frontenac's voice became almost querulous with impotent efforts to convey the veracity of his communications: "Not the star itself! One of the planets, or smaller bodies, in the Arcturian system. Come to me immediately, Drake; I must talk this over with you."

"Coming!" cried the younger man, and then his form faded out of the disc as the connection was broken.

Commissioner Frontenac turned away from the instrument board, clasping and unclasping his finely shaped, white hands as he gazed out, through a curved glass wall, across a vast, paved landing field. Strange aircraft hummed and rumbled above his head, or shot with the speed of lightning into the zenith from the atomic spirals. There was a mystical

order about the huge, hive-like hangars, the high-bounding pedestrians with their anti-gravitation belts, the distant, skyscraper office towers and residential blocks such as he looked out from. Yet all was turmoil for Brest Frontenac, veteran law-maker of the World Socialized Nations. Emotion remained for him and his class of *artates*, to whom the expressionless, all mind *compurions* were subject and the tidings of his daughter's unexpected survival had aroused all the sensations of affectionate fatherhood. She had been his ideal child, her pro-generation from 'a government mother the culmination of thorough application of advanced eugenics and psychogenesis. He had thought her lost forever in the abyss of the infinite, had considered preparing for death in his agony of grief, and now came this positive evidence that she lived, however unattainable the world in which she lived. It was like regaining the mental outlook of youth along with the physical glandular attributes of youth. For the time he was truly young again in spirit as in body, and he almost ran like an impatient child as he paced the floor, waiting for Drake Hillard's coming.

CHAPTER II

Arcturian Relativity

FRONTENAC had bethought himself of a harmless solace during the wait for Captain Hillard, and when a signal light above the sliding steel door showed red, advising the arrival of the officer, the finely acoustical dome of the compartment was filled with appropriate, symphonic music. The commissioner looked eagerly across the spacious floor of his official chambers as the door slid open. His eyes lighted with admiration for the tall, fine figure the open panel presently framed—Captain Drake Hillard of the 51st Space-

Patrol Squadron in the act of switching off his anti-gravitation belt.

"Drake!" exclaimed the commissioner.

"Father—who might have been!" called Hillard, in a clear, ringing voice, as he strode forward, the snug, steel-gray uniform revealing the result of careful breeding to produce perfect proportions. Drake Hillard was an *artate* in whom the true spirit of youth still burned brightly, for he had had but two gland replacements, his years a scant one hundred and eight.

Without invitation Hillard seated himself on an odd air-cushioned chair beside Frontenac. They began to discuss the problem immediately, carefully restraining undue emotions, and in that restraint revealing the intensity of their feelings, to which they adhered as the only real pleasure-sources of life.

"Arcturus is beyond reach of our finest ships," Hillard frankly declared. "If a ship can be fueled for such a voyage, Nard Devonack is the only man who can do it."

"Devonack!" the older man exclaimed with some distaste. "But he was your rival for the affections of Alois. The man is almost an *artate*. How could you trust him?"

Hillard ran an atomic vibrator over his brow slowly, with obvious refreshment. "Permit Devonack to accompany the rescue expedition," he replied presently. "Even give him command."

"But the man is a fiend as well as a genius!" protested Frontenac. "Alois always feared him."

"Fiend or angel, he is the only man for the job, and I must ignore the rivalry between us, if his intellect can bridge the infinite to the Arcturian system. I'll let him have my flag-ship, *Meteor III*, for immediate reconstruction if he wishes. Have you called a compurion on the astro-physics?"

"No. I'll do it now." The com-

missioner turned to the television board. A few noiseless adjustments of dials, a panorama of faces and voices in disc and amplifier, then the connection and the order transmitted. "He will be here immediately," reported the commissioner, turning back to Captain Hillard.

The red signal over the door flamed again. In a tiny mirror-like device on the wall the two saw the large head and gaunt body of a compurion. Again the panel opened silently. Ignoring the *artate* courtesy of switching off the anti-gravitation belt inside, the compurion soared in one long, slow leap to a vacant arm-chair before the two who had need of him.

"What data have you on Arcturus and the chances of a super-fueled ship reaching that system?" Hillard asked. "I presume you know that a passenger from the lost *Bridge of the Abyss* has signaled from there."

"I HAVE been informed of the Terran woman's survival and her messages," replied the compurion, indifferently. "As to Arcturus, we know little of that vast system, except as a unit of the sidereal system. We know hardly more than Terran astronomers of thousands of years ago, though our figures are more accurate and our deductions more positive. At this opposition Arcturus is approximately thirty-eight light years from our system, many trillions of miles in linear distance. In an atomic ship, double-fueled, and accelerated in the vacuum to the speed of light, it would require possibly thirty years for the journey. Much would depend on the piloting of the ship and the orbital speed of Arcturus' constellation. After the ship was free of Terra's gravitation the speed of Arcturus' constellation would become an important factor. Many errors in the past were due to failure in allowing for orbital speed of one's

destination. Estimates were made with the point of departure and destination assumed to be stationary. But the moment a body is free of gravitation, the body of its origin quickly passes on, and another body in constellation picks it up in years to come. That will be your major problem in piloting a ship to Arcturus. You must make allowance for the movement and the direction of the constellations."

"And the conditions prevailing in the Arcturian system?" asked Hillard. "Can Terran life-forms survive anywhere, or rather, everywhere, since we have proof of one survival?"

"Not everywhere," replied the compurion phonographically. "But there are conditions favoring the survival of Terran life and Terran man in the Arcturian system, at least theoretically. The spectrum of the star itself is of the Terran sun-star type, being crossed by many delicate absorption lines caused by metalliferous vapors. Capella, Procyon, Aldebaran also are of the solar type, indicating a possibility, however remote, of Terran man's surviving on one of the worlds, or satellites of worlds, warmed by these vast gaseous masses, which frequently are larger in themselves than our entire system of sun-star and planets. Arcturus, particularly, has an advanced type of solar spectrum, and other known and mathematically demonstrated facts lead us to believe that life as we know it could survive, or be evolved to survive, in that system."

"And the visual location of Arcturus?" asked Hillard. "Remember, I have only a general knowledge of infinite astrophysics; I have specialized in Terran space navigation."

"Arcturus is a yellow star in the northern hemisphere—one of the four brightest in the entire firmament. It is located, to the naked eye, between the spraddled legs of Bootes, just behind

Ursa Major, the Great Bear. The novice can easily find it by following out the curvature of the bear's tail. Perhaps a quicker way of locating the star, for one not familiar with the constellation Bootes is the simple fact that Arcturus is the brightest star in that constellation I have named and described, the constellation Bootes. Is that clear?"

"SPLENDID!" interjected the commissioner who had been a rapt listener. But Hillard was seeking facts, and in a lover's anxiety for the safety of his beloved he had no appreciation of the limpid mentality of the compurion.

"Haven't I read in some of your bulletins, compurion, something about the planets and satellites of Arcturus?" the captain queried, apparently as unmoved by the human element in the discussion as was the compurion, who seemed to have no heart, nor even any intellectual enthusiasm that could not have been experienced by an automaton of flesh and bone.

"There have been such bulletins," replied the compurion. "In a series of exceptionally advantageous observations, using the Kerrigan space-scope, in conjunction with mathematical formula, we were able theoretically to locate several planets in the Arcturian system. We discovered that, of the myriad planet bodies in the gravitation of that great star, not one would support life as we knew it owing to extremes of temperature, but that the satellites of those planets were in many instances habitable in so far as proper temperature was necessary for such habitation."

"May I ask an irrelevant question?" inserted Frontenac, who for the last few minutes had been waiting for an opening.

"Certainly."

"What is your explanation of the means by which my daughter reached

this star system?" asked the commissioner.

For the first time the compurion hesitated a moment before proceeding with his automatic speech: "There are a number of explanations, hardly theories, but at least hypotheses. As a passenger of the *Bridge of the Abyss* she was supplied with food tablets, space-bottle and rocket gun for surviving in space several months if necessary. Flung free of the wrecked ship, she might have been drawn into the gravitation of a meteor headed into the abyss toward Arcturus. That she reached the star system in little more than ten years may be explained by assuming that she already was on the outer edge of the gravitational field of the Terran sun-star. The assumption that she was picked up, or kidnapped, by an alien space-ship, is of course remotely possible, though we have no proof of such ships."

"I am not so sure there are no means of super-transportation beyond our gravity," murmured Hillard. "I have seen strange things in the ether, and heard stranger. But, enough. That is all, compurion, unless the commissioner wishes to ask more questions."

"I am satisfied."

They were sitting at a small, light, metal table, poring over a mass of figures and curious sybols, when the compurion departed as he had come, in a long, flying leap, like slow motion cinematography.

CHAPTER III

The Dark Genius

NARD DEVONACK, wizard technician of the 51st Stellar Patrol hangars, looked up from the intricate fuel pipe assembly plans which he was minutely examining. A saturnine smile eerily lighted his asymmetrical features, as he saw Captain Drake Hil-

lard's blonde head turning to him from the door.

"The Universe keep you," said Devonack in a deep, mocking voice, as he stretched his tall, powerful figure to full height behind the glass desk. "Is this a friendly visit or a challenge to some fantastical stellar duel for the hand of Alois Frontenac?"

Hillard frowned. "This is no time for jesting, Devonack. Perhaps if you knew that Alois Frontenac was alive at this moment you would not greet me with this mockery and taunt."

Devonack's blue-black eyes lighted suddenly. He was an arresting figure as he stood there staring in amaze at Hillard. Combined with the full stature of the perfect *artate*, he had the massive brawn and skull of the super-mental *compurion*. A man to reckon with even in those times of supermen and super-machines.

"You mean Alois Frontenac is alive upon another world?" interrogated Devonack.

"Exactly," retorted Hillard coldly, "and you are the only man I know who may be able to design a ship that will be big enough to reach her."

Devonack had once more retreated behind his mask of subtle insolence, of overbearing superiority. "And you come to me for help knowing I am your rival for her hand. I suppose you think I will build this ship and then permit you to do the heroic feat of rescuing Alois in it."

"I have no such suppositions," retorted Hillard. "When her life is at stake, rivalry becomes secondary. Moreover, your hand will be the only one that might guide the ship safely upon so long a journey through uncharted space."

"Quite unselfish," sneered Devonack. "And what is to prevent me from shooting you from the air-lock shortly before

we reach her unknown port of refuge?"

"Perhaps nothing except my own strength and ingenuity. "I'll take my chances with you if you'll build the ship that will take us to Arcturus."

"Arcturus—um-m-m-m!"

"Aye, and you may use my finest ship, the *Meteor III*, if it is possible to install the extra equipment in it."

"I will think about it, Hillard—I will think about it. And you know I have never failed to do what I set out to do in science."

"**B**UT in hearts?" Hillard could not forbear the probe.

The snarl with which Devonack greeted the sally was fearful to behold. "Do not be too confident of your blonde beauty," rasped the technician. "I am one gland replacement older than you—and I have the brain of the compurion with the brawn of the artate. Do not forget that I have never failed!"

Captain Hillard bowed himself out under the red light, the steel panel sliding silently shut behind him. A moment the wizard scientist glared at the front of the door, then he turned with a growl to his glass desk, swept it clean with a sweep of his long arm and began a new series of calculations upon a huge sheet of white metallic substance. As he worked, muttering to himself, he reviewed the past fifty years of his rivalry with Captain Hillard for the affections of the commissioner's daughter. There had been nothing spiritual, nothing mental in his love for Alois Frontenac. He was too much the emotionless *compurion* to love any one with anything approaching transcendentalism. Among any of a thousand beauties he might have had, Alois Frontenac must be the one, and, by the powers of fascination that he knew so well, he had held his own with Hillard, whom he knew she loved for his spirit, his personality, that time-

honored quality of the *artate* known to psychology as *lovableness*, whose value was independent of mental or physical powers.

Devonack swore a great oath as he worked with demoniac speed and accuracy on the plans for rebuilding the *Meteor III*. He would rescue Alois Frontenac, but not for Drake Hillard. Somehow the fates must conspire to play into his hands. Out there beyond the farthest Terran man had ever ventured, he would win the woman he desired and obtain a sweet revenge on his confident rival. The woman was not worth it—revenge was not worth it, but the enormous selfishness of his ego demanded it. To satisfy himself he would win the world and destroy it to-morrow in an evil whim. After that, what need of his ever returning to Terra? There were other worlds, and he was sated of the one he knew. With new organizations of atoms he could perform new miracles of science to satisfy his gormand appetite for victory. Thus, as he toiled, he dreamed, his blue-black eyes brooding like dark moons beside the thin, high-ridged nose, above the cruel, tight mouth. And as the plans for the rebuilt ship to bridge the gap between the stars grew under his stylus, so grew his plans for personal aggrandizement and colossal intellectual ambitions.

CHAPTER IV

Projection to the Stars

A VAST crowd had thronged the outskirts of the projection field of the mid-continental 51st Stellar Patrol. Commissioner Frontenac and all concerned in the actual rescue of Alois had endeavored to keep the plans for the flight to Arcturus from the public, but the news had leaked out, as such news will, and radio had spread it

in minutes to the farthest corners of Terra.

Strange faces looked on from the motley throng gathered at the great iron wickets surrounding the concrete paved area of the spacious projection field. High-speed transportation had accounted for unusual contacts between the races of mankind, and few were pure of blood in so far as nationality and color were concerned. A potentate of Algiers rubbed shoulders nonchalantly with a mayor of a large eastern city of the North American continent. *Pergansyds* from Venus, with their four legs and spider heads, gazed idiotically at the sky, beside gigantic negroes from the heart of Africa; the dog-men of Mars lurked at the edges of the crowd, aloof and morose in their attitude toward all the Terrans and their scientific projects.

Possibly half a mile from the iron-work that bounded the field, stood a circular trestlework nearly a thousand yards in circumference, looking somewhat like an ancient loop-the-loop in an amusement park, excepting that the dips and curves were much less abrupt. The track—for track it was—appeared low on one side, rising in a gentle, spiral-like swell to the other and highest side. On the lowest section, as at the beginning of screw threads, lay the rebuilt, *Meteor III*, ready for her desperate attempt to reach Arcturus. Like some gigantic garfish from a prehistoric pool, the ship lay motionless, wings and stabilizing fins spread for use in the lower, denser strata of atmosphere. Never before had a ship been fueled and provisioned for such a flight, and the low, deep rumble of voices from the vast aggregation of humanity and near-humanity, as well as the steady drone of radio announcers, revealed the intensity of world interest in the proposed venture. The well-being of Alois Frontenac also had its share in the popular interest directed to

the expedition, for she had been a well-loved and admired beauty.

The tension became even more intense as the time for the projection approached. Deep silence settled over the masses of onlookers, as the radio announcers called one minute before two o'clock through the field-amplifiers. Every eye was bent upon the spiral track, where lay the greatest mechanical achievement of the 50th century. . . . Then a puff of greenish smoke shot out from the streamlined apertures along the flukes of the great fish-shaped thunderbolt. A tingling sensation passed over the bodies of the onlookers from that center of released power. A thunder as of gigantic flapping sails in a cyclonic wind broke out, rolling away in every direction. Then the smoke from the rocket orifices thinned to a vaporous mirage, that whipped about in tiny streamers of heat waves, some rising in eddies above the field, like huge, fantastical smoke rings.

THE *Meteor III* seemed suddenly transfigured with quivering life. Like a goaded, high-strung race horse, she leaped away along the track with a ferocious hiss, the jets of vapor shooting out behind in steadily lessening density as their heat increased. Then the accelerators were released for initial velocity, and a roar like a continuous cannonade burst out. Around the spiral track the ship raced, faster and faster as the roar of the rocket tubes drowned out every other sound in the vicinity, setting earth and air alike to vibrating seismically. In a dozen revolutions, the ship had become a dim, gray streak, a blurred circular superstructure on the massive projection track.

A change was gradually manifested in the comparative elevation of the track spiral. The high side became higher, the low side sinking almost to the sur-

face of the field. Higher and higher rose the up-curve of the spiral as the ship thundered round and round. At last, with gyroscopic precision, the track tipped to forty-five degrees, the space-ship racing around the upper edge like a maddened bee seeking an outlet from an imprisoning net. Then, with a swift-ness bullet-like, the projection track dropped to normal level, leaving the speeding projectile in midair. . . . But the *Meteor III* did not fall. Like a streak of vapor, or a dull colored rainbow, the great ship shot across the horizon, rising in a vast curve over the sea of upturned faces, spiraling up and up into the heavens, until ten seconds after the track had been leveled the last detonation of the rocket tubes had died away in the illimitable vastitude of the Terran sky.

Commissioner Frontenac turned away from his specially situated seat at the edge of the projection field. A host of sympathetic friends and acquaintances accompanied him as he prepared to leave the field.

"I still have much of the old artate optimism in my system," said the commissioner gloomily, "but even that does not permit me to be so foolish as to expect to see them again. They have set out to die nobly in an impossible cause."

"Do not be too sure of your pessimism, comrade," said a companion. "That Nard Devonack has never yet failed in anything he set out to do. He could find a way to make oxygen out of the ether I do believe. If he cannot project the *Meteor III* to the Arcturian system then no Terran man could do it."

"And that is a poor consolation," rejoined the old law-maker. "As for myself, I shall be satisfied if we are able to hear from them occasionally by means of the trans-spacial code. And Devonack has failed in something already, I might add."

"What, comrade?" half a dozen chorused.

"To win the hand of my daughter from Drake Hillard," replied the old man. "Out there in the *Meteor III* are two mortal enemies in command. They may find Alois, with their gifts temporarily combined for one purpose—but only one, and perhaps neither, will survive that finding. What a pity that love and pride can make such wolves of men. Yet if we were all emotionless *compurions* what pleasure would there be in being a man? It is our defects that make life worthwhile; it is the weaknesses of men that afford the joys of living."

"Aye," affirmed half a dozen of his followers. "If we were perfect all would be miserable."

"Or dead," quoth a wag.

"And pickled in a vacuum with a label on the bottle," quotes another as they climbed into the helicopter air-taxis that would bear them back to the magnificent residential blocks of the modern city.

CHAPTER V

Into the Abyss

DRAKE HILLARD'S sensations as he rode the thundering *Meteor III* into the stellar darkness were an alternation of exultation and misgiving. Hitherto, following the projection of his space-ship for patrol duty, he had always experienced a vague disquietude, allied to the ancient fear of high places; but now all dread of the space abyss had vanished in his eagerness to locate Alois Frontenac on whatever world she had found among the stars.

Clad in his hermetically sealed space-bottle, with all emergency safety devices to be used if the ship were wrecked in the meteoric sphere, Hillard had no

semblance of Terran man as he gazed from a porthole in the main cabin, where a dark-finished disc reflected those views of the heavens not visible in the direct angle of perspective. Before him, manipulating the complicated controls, as the ship turned parallel to Terra's surface in preparation to pass the meteoric sphere, was the iron-fingered space-bottle containing Nard Devonack, the mechanical wizard. Devonack's dark head, symmetrical, yet somehow pleasing, could plainly be seen through the thick, shatter-proof, transparent composition that had been substituted for glass early in the development of space projection.

Occasionally, Devonack glanced back, and Hillard's jaws set as he noted the triumphant gleam in Devonack's eyes. Devonack believed he had Hillard in his power now—but the young captain was not so sure. Good friends he had among the crew, and Devonack was decidedly unpopular as a man, for all his gifts.

Twenty minutes later, by Terran time, they had safely edged through the meteors by flying with them at terrific speed, and were forging out into the blackness of the stellar vacuum, where the stars gleamed like daubs of blazing blue vitriol, and the sun looked on with sightless face and flying beard of flame. Always would Drake Hillard thrill to the wonder of spacial heavens and the unfathomable mystery of their depths; and now, when somewhere beyond that stygian pall hung the world of Alois Frontenac's imprisonment, it was doubly fascinating. Forgotten was the treacherous subtlety of Nard Devonack, that might strike fatally from the dark at any time; forgotten was the forlorn hope of the expedition, that had so little chance of reaching its objective. Hillard drank in the grandeur of their starry flight, and was lulled to drowsy daydreams by the muffled detonations of the speed tubes.

The ship seemed to its passengers motionlessly suspended now, though in reality it moved at the terrific velocity of 12,000 feet per second, almost due zenithward, with rapid increase in speed as gravitation and atmospheric friction receded. Gradually becoming adjusted to changes of gravitation and temperature, which at best was irregularly adjusted by the steam pipes from the boiler of the sun-reflector furnace, Hillard watched the crew take heart, and he moved among them with cheering voice and confident mien. He divined that from him would emanate the staunch, faith-making leadership that would sustain them through the years of the voyage, that already was weighing on them, though, out in space, time would become something highly mathematical and wholly without the drag of Terran computation.

WHEN Devonack was relieved at the controls by the assistant navigator, Hillard had his first word with the commander of the expedition—and his worst enemy.

"What are your latest figures on the time it will take us?" Hillard asked, without deference.

Devonack leered at him satyrically. "Do you think you will ever get there, Hillard?"

"As supercargo I certainly intend to be in at the finish," retorted Hillard. "You have command of the ship but not of me. Keep that in mind."

Devonack's thin lips curled. "Command of the ship, on this expedition, means command of all lives on board, Hillard. I can send you all to bottomless hell in five seconds."

"In that case we would have the company of our murderer," Hillard smiled.

The pilot's dark face underwent an odd change, as if he were reserving something, controlling a secretly known

certitude of triumph. . . . "It will run into thirty years or more," Devonack reverted to the first question abruptly. "I haven't the exact figures on the speed of Arcturus in infinite orbit. We're playing the game of intersection, you know. If you shoot a pigeon that is flying at right angles to your position you've got to make that pigeon run into the bullet. That's how this ship will reach Arcturus. Only we have more than wind velocity affecting our course, with gravity fields hauling us out of the Einstein curve, of course, every minute."

"Thanks," said Hillard, shortly. "You have explained down to me nicely. I hope you enjoy teaching primary class."

But Devonack was hopping away to his quarters in long, airy leaps, caused by the rapid decrease of gravitation.

Two hours later they broke through the net of solar gravitation on a course between Venus and Mars, and at a speed of 10,000 miles per second, relative to Terra's revolution, plunged out into the jewel-spangled, Cimmerian abyss that was the interstellar void between Arcturus and the small sun-star of Terra and her sister planets.

Hanging airily before an observation port, Drake Hillard watched the dimming of the green point of light that was the planet of his birth. Somehow, hope had died in him, during that period of transition between the outer edge of the sun's gravitation and the vacuum. Metabolistic changes were partly responsible for his mood, for circulation had been vastly accelerated, but the tangible threads of Nard Devonack were more directly the cause. Though he refused to admit it, there was more than egotism in Nard Devonack's inference of his absolute power. What revenge, he thought, for Devonack to let him live until they were almost upon the world of Alois' marooning, and then by some diabolical

scheme, of which the commander was perfectly capable, plunge him to his death into the void. Vainly, in that moment, Hillard clenched his steel-strong hands inside the space-bottle, assuring himself of his physical superiority to Devonack. There was some consolation in that.

He turned as Nard Devonack's voice sounded in the amplifiers that broadcast orders to the crew:

"Get out of your bottles. Test the air generators. . . . Switch on the gravitation plates, 72. Two million miles from Terra. . . ."

Drinking a dissolved food tablet, Devonack passed Hillard on a tour of inspection. He was already out of his bottle, clad only in clinging tights of artificial silk.

"A long way from home, Captain," Devonack jibed as he went on. "Out here dead men turn to ice and become worlds all by themselves."

Hillard muttered an indistinguishable reply as he walked unsteadily over the gravitation plates on his way to his private quarters for the removal of his space-bottle.

CHAPTER IV

Where Years Are Hours

EIGHT years, by Terran time, after the *Meteor III* had been projected upon its voyage of forlorn hope, the observers were able to see the corona of Arcturus, blazing yellow, almost directly ahead and slightly above the prow of the speeding ship, though in reality more than thirty years away. The planets of the solar system had long since disappeared behind them, or rather below and behind, since relative positions were deceptive and evanescent. Only the Terran sun-star still glared out in its incandescent halo, like

an overturned pot of fire, by chance suspended in impenetrable darkness.

The reactions of the crew to passage of time had undergone a complete readjustment. No daylight, no perception of vegetable growth, no drag of heavy gravitation had contributed to the acceleration or suspension, or time's passing. They ate dissolved food tablets; they slept scores of hours under the influence of mesmerizing electrolysis. Music, symbolic color cinema, and all forms of advanced amusements were continually supplied. They played games in space, attached to the ship by long, slender cables, propelling themselves with rocket guns, and totally unaware, save intellectually, that they sped through space at the speed of light, themselves infinitesimal planets, sweeping in universal orbit to meet the onrush of Arcturus in its inconceivable circle through the void.

Yet in spite of every conceivable medical and mechanical aid to health, two of the crew took sick with a malady common on long space-voyages, where the human organism was subjected to strains for which it was not completely evolved. None knew positively as yet just what caused these enervating attacks, but the cure was suspended animation. In hammocks, especially devised, the patient was placed and through stages of electrolysis, combined with atomic adjustments, the life-forces were stayed and stupefied in a condition resembling death. All artificial gravitation was released from the hammocks, and for days the ailing floated gently in the vault of the ship, following the slightest change in the currents of artificial air.

Drake Hillard kept on his feet, upborne by rising hope as the years marched on and the distance dwindled between them and the worlds of Arcturus' planetary system. A sort of si-

lent truce had come to characterize his contacts with Nard Devonack. In one respect their motives were mutual and interdependent: they must reach the gravitation of Arcturus, and to that end every man was valuable, especially with some men being incapacitated with space-sickness.

Then, twelve years from their destination, the first real break in monotony occurred. Watching with customary alertness from an observation port, Hillard sighted an oddly formed, solid body in the void, which dully reflected the light of distant suns. Sending a man out in a space-bottle; the object was brought in with little difficulty; in fact, it was inclined to gravitate toward the speeding ship as soon as they drew near. It turned out to be nothing less than a rocket cartridge of the type used in emergency passenger equipment.

"ALOIS!" was the first word that burst from Drake Hillard's lips, and while the others stood glumly by, and Nard Devonack sneered, Hillard broke down and wept, with the cartridge pressed to his breast.

"A clue sure enough," Devonack said, when Hillard had somewhat recovered. "But it might have been thrown out here by some other castaway, who was not so fortunate in finding a landing."

But most of the crew sided with Hillard in inspiring belief that Alois Frontenac had left the fuel cartridge there. For hours afterward a double watch was maintained in the hope of sighting further evidence of human passage in that illimitable emptiness, but there were no more material clues.

Fondling the fuel cartridge in his quarters, as if it were an only child, Drake Hillard was seized with a sudden, demoralizing fear, that brought him to his feet, with a groan on his lips. Never, from the time that message had

been received, had the thought struck him cogently: what of Alois' age? In a strange world, among an alien species of life, how could she obtain gland replacement? More than twenty years—no, twenty-five, had passed since the wrecking of the *Bridge of the Abyss*. And if he remembered correctly, and he seldom failed, she had had but a decade to live before another replacement would be necessary. Even now, on that far-away world, she might have aged and shriveled like Riger Haggard's Ayesha when the fire of eternal youth reversed its effect!

Stunned by the aftermath of that catastrophic vision, Hillard sank down, drawn and pale, his fingers relaxing on the rocket cartridge he had so fondly caressed. Not that he would fail her, even if she had passed the stage where rejuvenation could be effected. He would always love her as only an *artate* could love. But the horror of it—to think of that lithe, youth-bloomed mate of his dreams, tottering about with twisted spine and hag-worn, lipless features. And then a comforting thought occurred to him—perhaps death had claimed her. Better that, he was forced to conclude, than the horrifying wastes of that ancient curse of humanity, old age—as seen by youth.

Had it not been for that one consoling thought, Hillard might not have pulled himself together so soon. As it was, he regained a strained grip of himself, and went out to talk among the crew, with his usual optimism. Not for the world would he have revealed his secret terror to Nard Devonack, thus providing that fiend in human form with a sword to prick him with. So shallow was Devonack's love of Alois that Hillard knew he would gladly relinquish all hope of her, if it would cause his enemy and rival sufficient torture.

Such was his nature.

CHAPTER VII

The Second Call

IN the twenty-sixth year after embarkation a third of the crew of eighteen men, not including Hillard and Devonack, were continually ill with space-sickness. Devonack himself had a touch of it and took to the suspended animation cure for three long dreary months. Hillard was glad that he had always been immune, for long consumption of manufactured air and concentrated foods increased susceptibility to it. Had he been forced to the hospital hammocks, Hillard knew that Devonack could easily have done away with him by tampering with the curative appliances.

Yet all the crew had been well chosen for physical stamina, and only one died in the hammocks, to be buried in space, his body, preserved in a space-bottle, shot out of the ship's attraction by a torpedo-like automaton attached to the strange casket.

A month after the "burial," when some change was needed to alleviate depressive after-effects, they began to sight the planets and satellites of Arcturus through the strongest telescopes. All else was forgotten from then on, and drawn, death-white cheeks glowed with the ardor of fresh courage. On one of those points of light, encircling the monster sun, Alois Frontenac, or her remains, must be found. And though none none could yet conceive how her abiding place might ever be singled out from ten thousand worlds, they stubbornly refrained from pessimistic predictions.

"It seems strange that we have picked up another message from Alois," Hillard approached Nard Devonack, several days after the sighting of the Arcturian system.

The commander looked up from a litter of calculations at the weary, drawn

face of the supercargo. There was an odd gleam in the intense black eyes of the pilot. It was as if he restrained a diabolical triumph with great difficulty.

"I wouldn't trouble myself about it, Hillard," said Devonack. "That first message must have been a freak connection. Her apparatus may have given out, you know. And there's still plenty of time for picking up messages. A few years yet before Arcturian-gravity grips us."

Hillard considered, still consoled by the thought that it was probably all to no avail—that Alois was either dead, or beyond recovery of youth. He observed without concern the signs of repressed exultation in Nard Devonack's dark face. Doubtless the commander was merely gloating over the success of the voyage so far. Hillard turned to go, but Devonack called him back. The man was determined to torment him, it seemed.

"No need to hurry away," Devonack fawned, as a cat before a mouse, taunting it to make a break for freedom. "Why not chat a bit? Our truce is getting short, and there'll be no chance when we resume our little enmities."

"So?" Hillard eyed Devonack coldly.

"Quite, Captain Hillard. I thought I'd ask you what you think of the Arcturian worlds now that we are getting a four-year look at them?"

Hillard sat down—a gesture more than a posture of rest—glad to talk with one who knew their fate better than he.

"My conclusions would hardly be of any use to you," he said, indifferently. "But I must admit that a weirder conglomeration of planets was never dreamed of by a Terran poet. It looks to me as if the planets were all dead from extremely hot temperatures. If there is life, it must be on the satellites. Some monstrosity in the organic may

be found. It has always been my theory that life on far-distant worlds would prove far different from anything we Terrans could imagine. The germ of life evolves under the control of environment, and if a tree grows inside of a box it will be the shape of the box."

Devonack began running his pencil down the banks of an intricate graph as he replied, somewhat absently. "The theorists once thought that very thing about other planets in the solar system, but it didn't prove out—different forms, or combinations of forms, but fundamentally the same—all based on protoplasm. Solar life varies only with environment—temperature, available food, obstacles to propagation, and I wouldn't be surprised to find life like that all over the universe."

"For Alois' sake I hope Arcturian life is endurable by Terran life-forms." It slipped out before he was quite aware. For an instant he had forgotten the lurking devil in Nard Devonack. Already he was grinning. Hillard shrank even before he heard the vicious jibe from the down-curved, vampirish lips.

"I'll help you bury her, tearful artate," sneered Devonack.

Hillard thought that was all, for he had been hurt enough, but there was more to follow, and worse. Devonack leaned forward confidentially, his eyes boring into Hillard's brain.

"I say, Hillard, did you ever think what she would look like as a very old woman?"

"GOD—you!" The ancient imprecation sprang to his lips instinctively. In one bound Hillard had left his chair, his big, yet sensitive hands, encircling the dark throat of the commander.

"You beast, you fiend!" Hillard swore, crushing blindly at the flesh between his hands. "I thought of that—but to

hear it from you. I'll kill you! I'll kill you for it!"

But Devonack's clawlike fingers had swept something up from under the table. A flick of his thumb, and contact with Hillard's thigh, threw the enraged supercargo off his balance. He reeled away, stunned, gasping, tearing at his own throat in an agony of suffocation.

"Not so fast, Hercules," Devonack was drawling. "One more twist of this little plaything in my hand would have made a stick of wood out of you. Get out of here and be careful after this. My plans for you are all made. You'll find out soon enough what they are. Now move—if you can!"

Hillard glared helplessly as his strength slowly returned. Devonack had led him on with a cunning show of comradeship, only to lure him into a net of torment and persecution. There was nothing he could do now—as long as that atomic electrocutor reposed in Devonack's hand. But as he swung on his heel and staggered out, one thigh still numb and stinging, he resolved that a fairer day was dawning for his settlement with the heartless commandant.

Moments later, breathing hard and watching the play of varicolored light among the legion worlds of Arcturus, a ringing shout was heard from the operator on duty in the signal receiving room.

"Signals! Signals!" called the operator. "Alois Frontenac sending in transpatial code!"

Hillard leaped and ran, colliding with a dozen hoarsely shouting, scrambling forms, all headed for the receiving room.

"What was the message?" cried Hillard and half a dozen others.

But the operator was bending with drawn face over the dials, frantically adjusting them this way and that. Hillard held himself for seconds, then he

gripped the tense arm of the operator.

"What was it, man? What was it?"

The operator turned a gray face to Drake Hillard and those crowding in behind. "I've lost the connection," he groaned. "But I got this much before it faded out: 'On the—' and then a little later 'A. F., A. F., A. F.'"

"On the—what?" a bitter voice asked.

"She was trying to tell us where to land!" cried Hillard.

And then, in the solemn silence, a burst of laughter reached them from the main cabin.

Nard Devonack had laughed!

CHAPTER VIII

Red Sea Moon

HOURS of incessant manipulation of the receiver set failed to pick up again the ray impulses of the marooned woman. Gradually the crew returned to their duties, disappointed, yet with new hope of success. All save Devonack seemed to sympathize with Hillard in his agony of suspense, but there were many of them who favored Devonack because their lives depended on it.

After that fragmentary message from Alois, Hillard was able to identify, without a doubt, just which of the men he could depend upon if Devonack decided to do away with him before they landed anywhere. Five of them would stand by him, he felt sure, even if death were the price. He would not ask their lives in exchange for his, but there was a chance that with their help he might overpower Devonack and the others and take charge of the ship after it was clear just where they were to land. With five men in suspended animation, owing to space-sickness, Devonack would have but seven to do his bidding, though science would doubtless make

their number as effective as a million. All had their deadly atomic pistols, but Hillard knew that Devonack disdained them. He had deadlier weapons that he alone could use.

But during the last months of the voyage, human problems were dwarfed by the vastitude of the new star system revealed before them. Even to those seasoned space-explorers the blazing magnificence of Arcturus and its legion worlds was something surpassing the astounding. Grown to monstrous proportions during the last few years of projection, the giant star, aflame with vitriol-blue and red-orange, glared out at the Terran interlopers like the eye of an enraged deity. Most similar it was to their own sun-star at certain distances, and time and again they had to perform an intellectual right-about to overcome the obsession that it was their own life-giving Terran sun.

Only the tiny dots of planets and satellites, of monstrous and miniature worlds, scattered about the flame-fringe of Arcturus were unlike anything in the solar system. Through the telescopes these masses were revealed in extraordinary shapes and shades, not a few amazingly hued. While watching one of the prism-dyed spheres, the eye was baffled by a gradual shifting of tints, that prevented obtaining any definite idea of the color scheme. "Chameleon moons" became a by-word on the ship long before a clue to the location of Alois Frontenac's refuge was revealed. The strange bodies, during the last months of that age-long flight, became a sight to hold one spellbound by the hour.

Quite suddenly the spell of wonderment was shattered. Again from the receiving room came an exultant shout. Hillard leaped up from his hammock, out of a light nap, to break his way like a football player through the knot

of men centering on the receiver-room door.

"We have her again! We have her again!" the operator was shouting, his eyes glued to magnifier of the ray impulses.

"**H**OLD it! Hold it, man!" Hillard articulated, his hands unconsciously extended as if to seize that intangible connection between him and the girl he loved.

But the operator had begun to drone the message as he deciphered it from the spots and flashes in the kinescope eye of the receiver:

"On the moon of the red sea . . . On the moon of the red sea. . . Moon of the red sea. . . Alois . . . Alois . . . Alois!"

For minutes the message was repeated, the operator pronouncing each word as if it were the first. They hung upon it, devoured it, reveled in all the connotation of it, and one and all were keenly disappointed when the operator ceased speaking, adjusted the dials a few times, and then reported:

"Connection gone—faded out. She's having a time reaching us with that emergency set."

Drake Hillard left the receiving room walking on the airs of elation. A clue at last that would lead them on to the end of that long trail across the infinite. He cast himself into a chair before the telescope battery, and along with three other observers, began the eager search of the Arcturian heavens for a moon with a flush of red. The search seemed simple at first, but two hours of fruitless searching among the many, chameleon-changing worlds and sub-worlds reduced their confidence.

Hillard became conscious of an uneasy, restless feeling. He turned quickly to see Nard Devonack looking at him with an unholy gloating in his eyes.

At his darkly questioning gaze, Devonack turned back into the control room, chuckling. . . .

Thirty-six hours later they again picked up the code signals of the marooned girl. This time approximate mathematical position of the "moon of the red sea" was broadcasted, and Nard Devonack changed the course of the ship a little as they sped on into the phantasmagoria of worlds before them.

CHAPTER IX

Devonack Dreams

"THERE it is!" Hillard cried, face buried in a boxlike telescope reflector, three days after the third message from Alois Frontenac.

A babble of comment rippled from post to post at the news that the Moon of the Red Sea had been located. All available telescopes were manned seconds later, as the crew reveled in long-distance view of their objective. Only Hillard seemed to lose enthusiasm in that moment of triumph for which they had waited more than a quarter-century of their gland-multiplied years.

Backing away from the noisy aggregation around the telescope battery, Hillard stood alone, considering. It could not be long now before Devonack let fall the blow he had so long withheld. With the Moon of the Red Sea in view trouble and treachery might be expected at any moment. For surely, Hillard reasoned, Nard Devonack would prevent a reunion of Alois and her lover.

Hillard sullenly let his eyes travel over the men at the telescopes, pausing on those he could trust. Months before he had spoken to them privately. He was sure of five, and possibly six. Why delay the clash? Were not battles often won by surprise attack?

Abruptly he swung around and walked

over the gravitation plates to Nard Devonack's quarters, where, as usual, the commander withdrew upon demonstrations from the crew, to which he enacted superiority. Open expression of joy was beneath the dignity and infallibility of Nard Devonack.

"Come in!" called Devonack, at Hillard's knock.

The supercargo stepped inside and closed the door. He was tense and trembling with the temerity of his resolutions.

"Devonack," he spat out. "We've waited long enough. I'm sick of this suspense. Let's have it out now. Five of the crew will stand by me. With six in the sick hammocks I have a chance to best you. What about it?"

Nard Devonack's dark face took on a sly, tantalizing expression of amusement. He lolled back deeper into the air-cushions of his hammock.

"Sounds thrilling, Hillard," he spoke slowly, with a taunting drawl. "Mutiny in space, eh? Crude, boy—very crude. I have other plans."

Hillard's hands clenched and his eyes shot fire as he glared down at the supercilious commander. "Then let me hear them now, Devonack!" Hillard demanded, one hand straying to the atomic pistol strapped at his side.

"Better keep your hand off that machine," Devonack warned, softly. "Those pistols have a way of back-firing before a negative repulse wave. And that's what I have in my hand here under the cushion."

Hillard's hand wavered and came away, to drop limply by his side.

"That's better," Devonack announced. "Patience is a prime virtue among the artates—and especially in this instance. It would be a mess to blow you up in my quarters, after all the nice plans I have in store. Think, Hillard, what greater revenge there is in suspense?"

Your psychology teaches you that some mortals get a peculiar pleasure out of making others suffer. I am one of them, and you are my enemy and rival. That makes my pleasure doubly keen."

"**B**EAST!" Hillard hissed.

But Devonack was enjoying himself to the utmost. "Think, Hillard, what a blow it will be if you find your lovely Alois all shriveled up like the hag she would be without the gland replacements. Do you think I would deny myself the pleasure of that moment?"

"Her messages reveal nothing of the sort!" snapped Hillard. "If it were true she would have signaled us." His words were hot with conviction, but deep in him he was not so sure.

"If she still is fresh and young my plans will change a bit," sneered Devonack. "You know I still want her as much as ever. And how delightful an experience to leave you alone on the Moon of the Red Sea, while I carry your bride away on my honeymoon."

"She would take her own life first!"

"Not after I use some of the forces that I understand."

"Mesmerism, you mean," Hillard said with open disdain. "Can you possess a woman with pleasure after you have subjugated her with an electrode?"

"Certainly, because I am a little different in make-up from the pure artate," declared Devonack, talking on as if pleased with the sound of his own voice, rather than Hillard's reactions. "But to return. If Alois still is young, or we can save her with an immediate gland replacement by our surgeon, then I plan to take her with me to some ideal world in this system. I have achieved greatly. After this voyage there is nothing greater to be done. And after I have left you to die of thirst on some barren asteroid—a pleasant drama which I shall

watch through a telescope at a distance—well, we shall see."

Hillard turned to the door and paused, looking back, his tall figure trembling with impotent indignation. "Yes, we shall see, Devonack. We shall see."

Nard Devonack's taunting laughter followed him mockingly down the corridor.

Hours afterward Drake Hillard still was fuming as a result of his interview with Nard Devonack. Brest Frontenac had been correct in his estimation of the guiding genius of the rescue flight. Devonack was a devil incarnate, and only too well had he mastered the situation in the attainment of his selfish ends. Driven by desperate suspense as to his fate, Hillard could then and there have fought it out with the commander, however great the odds against him, but there were five other lives to consider. He could not lead his friends among the crew to self-sacrifice to further his own motives. There was nothing left to do but to endure, and hope that time and chance would bring a change in the situation. Devonack's dreams of merciless revenge and lawless freedom of the skies might yet come to naught in the problems before them.

Nor could any man long have maintained despair before the vision of these wonder worlds toward which the *Meteor III* sped on wings of light. Settling down before a telescope, Drake Hillard composed himself, and felt the persistent surging of fresh courage as he watched the new world grow larger.

Clearer and clearer became their view of the Red Sea Moon. There could be no question about its identification now. A splotch of deep scarlet, similar to the famous spot on Jupiter, distinguished it in that throng of multicolored planets and satellites. Though the color of the spot never showed quite the same tone from minute to minute, changing subtly

from sea-shell pink to deep and bloody vermilion, it was always primarily red, like a pool of some organic dye under varying intensities of light. Around the red spot the satellite held more or less to a pale mauve, which shone out in high contrast to the "chameleon moons" around it.

AWE-INSPIRED by the magnificent pageantry of shape and vastitude and color, the crew of the rescue ship crowded the observation ports and telescope batteries as the long dive into the atmosphere of their objective began, and the gravity indicators gradually moved around the dials to the location of the Red Sea Moon.

Code messages were again picked up from Alois Frontenac. But they occasioned no surprise now. At Hillard's request, as well as Nard Devonack's, the operator endeavored to reply to the messages, but the connection was so uncertain that they could not know whether their messages were received.

All were puzzled and mystified by a repeated phrase that came off and on in varying intensity for nearly an hour. It was: "Prepare for the unbelievable. . . . Prepare for the unbelievable."

"Great Universe!" scoffed Nard Devonack. "If she can show us more than we've been through, we'll have to get new brains to appreciate it."

But Drake Hillard was silent and secretly jubilant. Only the unbelievable could save him now, and that message from space, from the strange moon-world before them, was a voice of vague, yet luring promise.

CHAPTER X

Last Hours

FOR days that passed like hours of deep sleep they fell into the gravity of the Red Sea Moon.

Each man knew, but spoke not of it, that the greatest danger of the voyage still lay before them—landing under unknown conditions, with calculations that might all be wrong under test. Thus they toiled through the last hours of the voyage, revising and revising over again their calculations, testing the temperature of the moon by spectroscopy, gauging the degree of gravitation, analyzing the content of the atmosphere, also by spectroscopy, and studying the nature of the lithosphere.

Arcturus, now in the zenith, had grown by this time to tremendous proportions, almost a heaven in itself. The great sun appeared nearly five times as large as the Terran sun, though the heat was no more noticeable, the star being in a different stage of evolution, which reduced comparative radiation. But it was the corona that made the star loom so vast in its blazing incandescence. Veils and streamers plunged and wavered in a halo a million miles in extent, like some infinite multiplication of the Terran northern lights.

Eyes glued to the ray-filtering lenses of high-powered telescopes, both Hillard and Nard Devonack studied intently the slowly enlarging surface of the Red Sea Moon. A faintly discernible mist baffled detection of details for some time. It was Devonack who solved the mystery of the elusive vapors.

"Effervescent salts in immense quantities," he announced, after long study through a specially designed spectroscope. "The lowlands are steaming with some kind of ferment. And that red stuff is the nearest thing to pure water on the entire globe. Life must subsist on some other kind of liquid nourishment."

Equally impersonal in this extremity, Hillard replied: "But there's a kind of vegetation on the highland, or plateaus. Looks like real trees a few miles from

the edge of the red sea. What was the last temperature report?"

"Seventy or eighty Fahrenheit," answered Devonack. "Can't tell for sure until we get through these outer layers. Spectrum approximate is the best we can do. Looks as if we can breathe though down there. Plenty of oxygen—and something else that must be rising out of those effervescent swamps."

Two days later the exultant shouts of the long-imprisoned crew heralded the first tangible evidence that the end of the voyage was near.

"Oxygen! Oxygen!" they called until the steel-walled chambers of the ship rang and echoed with the news.

"Hear that roar, will you?" an observer called to Hillard. "Never heard anything as sweet as the whistle of that breeze."

Behind them Nard Devonack laughed, a mingling of exultation and derision. For it was not yet a breeze that caused the roaring noise; it was merely the thinnest outer layers of atmosphere, whipped up as the space-ship's collapsible wings and steering fins were spread while still they dived at terrific speed.

THROUGH fifty miles of stratosphere they plunged, checking speed with nerve-racking slowness, with blast after blast of braking rockets. The roaring rush of alien atmosphere on the plates and projections of the ship became a deafening cyclone. Test after test was made of the thickening air strata through which they fell. And more and more assured they became that they could survive without the use of breathing masks or oxygen tanks. That Alois Frontenac lived was not incontestible proof that they could, for they did not know the conditions under which she existed. No conclusions could they jump at in this emergency; the

tests of science must decide success or failure.

Stayed by the powerful play of the suspension rocket batteries, the *Meteor III* settled slowly over the blood-red sea that had been their guide. At an angle that would bring them to the surface somewhere along the shore line of mauve and white crystals, they descended. Down and down they volplaned, no sound audible save the rumble of the suspension rockets that tirelessly counteracted the clutching gravity of the Arcturian moon. Under the skilled control of Nard Devonack, the *Meteor III* came at last to rest with scarcely a noticeable shock on the effervescent sands at the edge of the blood-red deep, and for the first time in more than thirty years, in earth-time, the keel of the rescue ship grated on solid matter—a landing in a new solar system.

All was orderly and calm within the ship. Cool heads now worked in perfect cooperation. Resonant, preternaturally clear, the voice of an observer sounded in the speaking tubes leading to the main cabin and control room:

"Gravitation 55.70—ten degrees heavier than Terra."

And from another quarter: "Air good; we can breathe without filters. Gas from effervescent crystals not dangerous."

"Heigho-ho, Hillard!" It was Devonack's mocking voice as he came in behind the captain's position at a port-hole in the main cabin. "A fine place for a pharmacy, eh? And a better place for a cemetery."

Hillard whirled, scowling. "This is no time for inferences, Devonack. A woman is waiting for us somewhere. What are you dallying about?"

"All in due time, Hillard, my emotional artate. My patience and your impulsiveness would make a very bad team." Maddeningly dilatory, the commander leaned against the oval, steel

door-casing, his black eyes glittering.

"I'm just planning a method of making certain that you do not make any breaks for liberty until I finish with you," Devonack deigned to explain. "If it wasn't for your eagerness to help locate our fair damsel I'd leave you in irons. But I think you'll be of real service—in the right company."

"Just what do you mean, Devonack?"

The commander straightened as quickly as he could in the heavier gravitation to which none was yet accustomed. "I mean this, Hillard. You can have charge of a searching party, but I will pick your men."

"AGREED!" exclaimed Hillard. "What happens to me is unimportant. You need have no fear that I will bring Alois back to the ship if I find her. And as long as I live every effort will be made to see that she is taken safely back to her father on good, old Terra."

Devonack whirled to a speaking tube. "Open the air-locks! All hands outside but the hospital watch. The search for Alois Frontenac will begin immediately!"

Like a horde of small boys released from an onerous school room, the crew piled out of the air-locks near stern and prow. Devonack lined them up quickly, barking his commands in the still, stinging air of the moon, like a drill sergeant training a company of recruits.

"There will be no poking around in behalf of science," Devonack addressed them. "Every man but one radio operator and the surgeon is detailed on this hunt for Alois Frontenac. If we receive a call from her the ship operator will broadcast on our portable wave-length set. That leaves twelve of us for the searching parties. We'll need three. . . Hillard, you lead the one inland. I'll take the one to the left along the shore of this bloody sea. Arkwright will

take the one to the right. All ready now?"

He rapidly tolled off the men, three to each detachment besides the leader. Hillard noted with a shrug that his men all were unquestionably subjugated to the will of Nard Devonack, and each of them a good match in a physical encounter. Moreover, Devonack took them aside and whispered confidential orders, before they were placed in charge of the detail leader.

A final word Devonack gave the detachments: "I am satisfied that Alois Frontenac cannot be far from this red sea," he declared. "She used it as a landmark, and she must be along the shore somewhere, probably trying to use her ray-impulse outfit to get in touch with us." He leered and grinned at the pained expression on Drake Hillard's face. Not without purpose had he ordered Hillard's party inland; they would be the least likely to find Alois in that direction.

"And what are we to do if we find her?" Hillard asked, coldly.

"I was coming to that," retorted Devonack. "The signal for returning to the ship, which may or may not mean we have had any luck, will be three blasts from a pressure side-arm in quick succession. It will serve as a distress signal if repeated once or twice. Are you all ready?"

A chorus of affirmatives responded, and with a wave of his hand Devonack gave the signal for the search to begin.

CHAPTER XI

The Unthinkable Thing

AS Drake Hillard led his party slowly inland from the edge of the sluggishly rolling, mercuric sea, he reviewed bitterly the persecutions of Nard Devonack and the futility of all he could plan for Alois Frontenac's safety, if, indeed, they were fortunate

enough to find her. The three men with him were more guards than aids; like Napoleon on Helena, he was free to pace the edges of a circle. Now and again, he glanced back at them casually, noting how they let him go on ahead, dropping back together and conversing in low tones.

Then the strangeness and fantastic beauty of the new world gradually overcame his despondency. Above, in a hazy, yellowish sky, loomed the rainbow sphere of the planet to which the Red Sea Moon was attached by force of gravity. Still higher, as one mountain seen beyond another, the glaring crest of Arcturus spread across the sky. And underfoot and ahead was no less marvelous a view.

The white and purplish crystals crunched incessantly under their gravity-weighted boots, exuding a smarting, irritant vapor that grew less and less noticeable as they reached the low, dune-like hills at the edge of the littoral zone. Climbing the gentle slopes, Hillard observed signs of a fungoid vegetation, growing sparsely in the red, gritty soil of the ravines. On examining the weedy growth he was amazed to find it brittle. The stuff was hardly vegetal save in appearance, but more like the frost on a window pane, with the temperature drastically reduced. Touching it to his tongue, he discovered it had a sweetish, pleasant taste. But he did not make the mistake of swallowing any, even though he craved a change of fare, after the years of food-tablet consumption. Too well he knew that not a few deadly poisons were sweet enough in small quantities.

There was no word between Hillard and his followers as they climbed steadily higher into the weird foothills. Trees of unique variety began to appear. Purple from trunk to bud were these arboreal freaks, the shoots of underbrush a

bright red wherever the trees were largest and most numerous. Hillard likened the scene to a vast Carboniferous Era cave, where stalactites and stalagmites had formed in the shape of trees and bushes.

They were two miles inland before anything pertaining to organic life was discovered. And this was a tiny streamlet of bubbling, ice-cold water. It was not clear, but a few tentative sips revealed that it was drinkable, and throwing caution to the winds, that did not blow there, all four buried their faces and drank.

Resting from the strain of climbing under the pull of heavy gravitation, Hillard ignored the other three as he adjusted his portable receiving set, in an effort to pick up signals from the ship. He divined that Alois had no radio, and that her ray-impulse messages must be rebroadcasted from the ship if the rescuing parties were to hear them.

"She has worn out her sending set most likely," one of the men volunteered, casually. "Those super-generators they use in emergency equipment won't last forever. Probably trying to make it work and can't."

Hillard was inclined to agree, though he made no comment. There certainly had to be an explanation for the increasing uncertainty of Alois' messages.

They went on through the fairyland of the new world, following the banks of the stream, that here and there was stained with purple and red from the solution of some mineral in the soil. . . . An hour more they trudged on, while Hillard gradually gave up hope of finding Alois in that direction. He was half inclined to start back, waiting in the hills for a signal from the other parties. But the fantastic shades and formations lured him on.

The three behind were some fifty yards away when one of them suddenly

called out in a shout that brought Hillard back on his heels. He turned. One man was pointing to a dense thicket of purplish undergrowth across the stream. And then all three were starting in that direction, talking excitedly. Hillard started forward, stopped and stared. His hair prickled, and from his throat leaped one hoarsely spoken word:

"ALOIS!"

In three strides he had crossed the stream, and was crashing through brittle, crumbling entanglements. Halfway to the still figure of the woman that was watching them, Hillard's stride faltered and broke. This was and was not Alois Frontenac. He sensed an alienity in that statuesque, marble-cold figure. It lived as flesh lived, yet there was no response in the cold stare centered on him, as he forged into the lead of the others.

And then he was before her—within arm's reach of that stark figure. Yet she did not stir, nor seem to recognize him.

"Alois!" he groaned, "Don't you remember me?"

His eyes swept her impersonally. There could be no doubt as to the physical resemblance. Yet as he paused at the chill blue eyes, that seemed to pierce into his very soul, he shuddered. In the flesh this was Alois Frontenac, famed Terran beauty; in spirit, in mind, she was as alien as the galaxies of the Milky Way.

And then the woman spoke, fearlessly, mechanically clear, in perfect English: "I have been watching you. Come, I will show you my people. Among them you may find whom you seek. But I am not the one."

An enervating horror had stolen into Hillard's veins as he agreed to follow the woman, and signed to his men to do the same. Swiftly that physical shell of Alois Frontenac led the way further

inland to a low, jutting tableland, that weirdly overhung the strange forest of mineral formations. Under the wall of the rim-ledge, about halfway up the ridge, they came upon several small caves. At the mouth of one of these their guide stopped.

"Here," she directed with expressionless brevity, pointing down with one shapely hand. "Watch."

Hillard and the other three Terrans looked down curiously, their eyes widening as they discovered several small, spongelike creatures, whose porous texture was suffused with chameleonic tints. As they looked the creatures changed color a dozen times, with the most delicate gradation between the primary shades.

"What in the name of the Universe have we stumbled on?" one of the men burst out.

"SILENCE!" commanded the woman in tones that brooked no disobedience.

Suddenly, as they watched in fearful fascination, the sponge-like shape of the creatures began to alter in accord with the tints. The colors merged into a pulsating pink, as of supernally delicate membranes. Amoebic pseudopoda were formed from a rapidly expanding nucleus. Spellbound now, the Terrans watched as the masses grew larger and larger.

Hillard glanced at the woman. She was waiting calmly, apparently unaware of his penetrating gaze. As if by some hypnotic influence his eyes were drawn back to the expanding masses. Not again did he look away.

Before his eyes, in seconds, he saw a human form take shape, passing through the phases as if in slow motion pictures. The other forms had ceased to change now. They were shrinking back into their former diminutive state,

as if watching the progress of their fellow's miraculous transformation.

Hillard could not realize what was happening at first. Then his trained intelligence identified the astounding phenomena. A living human being was taking form before him. All grew out of that pulsating nucleus of prismatic flesh in protoplasmic condensation. A child stood before them for an instant, a beautiful girl-child, with auburn-tinted hair and ruddy cheeks, then an adolescent maiden, and last of all the broadening and swelling of maturity.

Minutes after the change had begun a second exact physical counterpart of Alois Frontenac stood before the stunned, incredulous Terrans. And in the eyes of that new-born woman was the same intellectual coldness that characterized the woman who had guided them there and had instigated the miracle.

The first woman turned to Hillard. "That is how I came to be," she said simply.

But Drake Hillard could contain himself no longer. "But where is the real Alois Frontenac?" he implored. "If you have harmed her—"

"We have not harmed her," interrupted the woman, imperiously. "She is not far away. Come. My new sister and I will help you find the real earth-woman. But there are many more like us—like her in body. The original Alois will be hard to find. You see we brain-people assume any form that appeals to us, or which is most comfortable for purposes of existence. We need only see the form to accomplish the transformation or duplication. Billions of years ago we were in your low stage of evolution. Now we have become all mind, so to speak. We can speak the language of the atoms as well as your language; we know the secret of life, which cannot be expressed in the terms

of your inferior intellect and senses."

The woman talked on to the spell-bound Terrans as they proceeded back toward the red sea. Once Hillard managed to ask: "And now I suppose your people will transform themselves into men like myself and my companions?"

"No, not immediately," the woman replied. "We cannot at present produce the male because we are all females. But perhaps we can formulate a new evolutionary process. Many eons past the male prototype was absorbed by the female. Then followed the reduction of our normal form to merely the brain, as we became mistresses of environment and completely in control of all matter connected with our neurons."

"Then you, yourself, have actually seen Alois Frontenac?" Hillard ventured, pathetically eager.

"Not the real woman. I merely know about her. I came into being just as my new sister here—from seeing another of my people in the form of the Terran woman. Who saw her first I do not know, but the form has become a fashion with us. We pass it on from one to another as I did recently before the cave."

Hillard shuddered. "And you have no feelings whatever, no emotions."

She looked at him curiously. "I know what you mean, but emotions are futile and dangerous. We could imitate, or as you say—*feel* an emotion that happened to strike our fancy."

But Hillard could endure no further discussion of a subject that was becoming excruciatingly painful. It was torment for a jealous lover to forevision a score of counterparts of his loved one. And he was beginning to fear that something tragic had happened to the real Alois. Glumly he led on, the brain-women on either side. And now Hillard knew what Alois had meant when she

sent that message: "Prepare for the unbelievable."

CHAPTER XII

A Doom and a Dawning

DRAKE HILLARD and his escort were halfway back to the mercurial sea, in the midst of the effervescent littoral zone, when the stunning blasts of a pressure pistol were heard not far away—three detonations in rapid succession. A gleam of hope brightened and died on the leader's face. They might have found the real Alois, but more likely they, too, had been deceived, unless it was Devonack's party.

He drew his long, slender, bulb handled side-arm and fired response. They ran on at a heavy trot in the direction of the signals, the women trotting easily beside them, wholly unconcerned.

A few minutes later they sighted Arkwright's detail. They were also running, and they had among them half a dozen Alois Frontenacs. Again Hillard's hopes rose as the two details neared each other. Perhaps one might welcome him with that happy shout he had heard years before on faraway Terra. But his anticipation died in embryo. They were all brain-females, with that cold, questioning stare.

"Which is the right one?" Arkwright panted up to Hillard. "If any one knows you should."

Hillard shook his head slowly. "None," he replied. "These creatures are an undreamed form of life. Brain people they call themselves. But Alois started this transformation fad among them. She is somewhere. And I can tell her among a million of these protoplasmic effigies."

Arkwright was about to speak when three blasts of pressure pistols, fired in unison apparently, so stunning were the reports, burst on their ears in the direc-

tion Nard Devonack's detail had taken. Hillard followed the others as they raced toward the signals, but he was not so eager now. More imitations of the real woman, he divined, though Devonack could be expected to know if he were mistaken.

Panting up a long slope of white crystals, eyes smarting from the vaporous emanations, they came in sight of Devonack's detail. A shout went up as they saw the four Terrans completely surrounded by brain-females, some twenty strong, and Amazonian in their lithe strength.

Drake Hillard stopped dead, searching the oncoming forms of the brain-women, whose faces stood out palely from the billows of red-gold hair. Like Neptune's handmaidens they came. And then he saw one who led the throng, her head thrown back alertly. That face could not have deceived him if he had failed to note the shreds of clothing that still clung ribbonlike to the soft contours of her body.

"**A**LOIS!" Hillard called in a long, broken moan of relief.

Above that hubbub of cheer and answering cheer, she must have heard him, for she came on at redoubled speed, arms outstretched, lips framing inaudible paeans of greeting.

Hillard scarcely knew when he broke into a run toward the woman, who now had far outdistanced Devonack's party. But he was a good hundred yards ahead of his and Arkwright's details when Alois flew into his arms. Kissing, laughing, hugging, they stood there oblivious of all, a Romeo and Juliet in an enchanted garden of the gods.

"It has been centuries waiting," she wept.

"Centuries and more, Alois," he rejoined. And you haven't changed; I was afraid."

"The generator gave out," she was gasping a broken explanation of details too numerous for coherence. . . . I had to keep repairing it . . . Finally it wouldn't work at all . . . I didn't dare tell you about these creatures. You'd have thought me insane. Now you know, you see . . . Oh, Drake!"

Then they became conscious that they were not alone. Something of amazing significance was happening all around them. The brain-females were flinging their arms about the crew of the *Meteor III*, showering them with kisses in wild abandon. A few of the compurions, to whom such demonstrations were distasteful, were fighting them off, but others welcomed the caresses with enthusiasm and reciprocity.

Hillard had to tighten his embrace on the real Alois to assure herself that there was no cause for jealousy. Alois had burst into almost hysterical laughter.

"Isn't it ridiculous?" she finally articulated.

"Ridiculous," he echoed. "It's worse than a twentieth century movie!"

"Oh! And look at that one! She slapped Nard Devonack right across the mouth."

"And he deserved it," growled Hillard.

The truth was that the brain-females had discovered an emotion that appealed to them, and they were imitating it very realistically. As an example Hillard and Alois drew apart a little distance, and gradually sufficient order was attained for the march back to the *Meteor III*. Nard Devonack had drawn away by himself, and his face was black with rage. His dignity had been violated, and his grip of the situation threatened by the disorderly acts of the brain-females.

Hillard foresaw trouble and he was not mistaken in doing so. No sooner had they reached the ship than Devon-

ack sprang to the top of the ladder leading to an air-lock.

"Attention!" he bellowed.

A semblance of quiet fell over the huddled brain-women, who clung by threes and fours to the arms and necks of the crew.

"All men of the crew break away from that mess of beasts and line up to one side!" thundered Devonack.

Reluctantly the women gave way as the men, some of them grumbling, obeyed orders.

"Draw your pressure guns!" yelled Devonack.

Some obeyed immediately; others were slower. But Devonack's hand was up and in it was the little instrument that could blow them all to bits, if it was used to explode their own weapons.

"When I say 'fire' blow these she-devils to the bottom of the Universe!" commanded Devonack, sweeping the assembly with his burning eyes. "And before we leave this moon I'll kill the last of them. Hear!"

The crew groaned at the merciless edict. Hillard made a move toward the commander, to protest though it should cost him his life. But Alois stayed him. She was looking up at Nard Devonack. Proudly, in his pose of power, Devonack looked back.

And what do I hear from the queen of fashion on the Red Sea Moon?" sneered Devonack.

"This—brute," called Alois, scathingly. "You dig your own grave by this merciless command. You do not conceive the powers of these people. Harm a hair of them—attempt to—and you'll never live to gloat over it! They saved me from old age without our crude surgical methods—and you are an infant in their hands."

High and long and blasphemous Devonack's laughter rang out. Godlike, he swayed above them, in his hand the

highest reaches of Terran science in a death-dealing weapon. He turned to face the crew—to carry out his ruthless command. But a woman stepped out from the throng. She raised a hand. Trumpet-like she spoke. And Devonack paused and listened.

"TERRAN," cried the brain-woman. "We have heard your plans. If it were not for that gentle emotion that has been instilled in us by these two Terran lovers, you would be worse than dead. Let me see the plaything in your hand, the toy of your feeble brain. Try its potency. Demonstrate the wizardry of your science. See! I have no weapon. I look and speak. That is all."

Nard Devonack laughed, but the ring of it was hollow. With a hiss of hate he flung out his arm. Men screamed. The lone woman before the commander seemed to glow with flame. Smoke rose from her red-gold hair. Yet she smiled and laughed in that halo of infernal fire.

The glow faded. A wisp of vaporous ash floated away. Still she stood, arms folded, smiling, eyes fixed upon the figure of Nard Devonack, crouched in menacing attitude at the top of the ladder.

So long did the tableau hold, that many shuffled restlessly. Hillard studied Devonack. What was wrong with the man? His atomic electrolyzer had failed apparently to destroy the brain-woman. Yet astonishment alone could hardly hold a man in such a trance.

It was the conqueror in the strange, unearthly duel who spoke, confidently addressing the firing squad, who awaited their unpleasant duty.

"Terrans, who taught us love, and all the hates and furies that go with it—I have erected an everlasting memorial to the man who bridged the abyss between

star systems. Behold! A likeness is it not?"

And then the truth dawned hazily upon them. One by one they ventured up the ladder to the air-port where crouched Nard Devonack, his face a mask of fury. Men drew back in awe as they touched that motionless form. Statue indeed! Memorial, yes—for Nard Devonack was hard and cold as stone.

"What have you done?" Hillard turned to the woman challenger.

"A simple trick for us—transmutation of the organic to the inorganic. Have you not gradually simplified your control of energy in the evolution of your science? Do you not now perform by the pressure of a button what once required a day's intricate labor?"

"Yes," agreed Hillard, mystified.

"Then add to your progress a billion years of progress, of incessant simplification. That is the secret of our power. To think is to be and do. But we are very tired of the past. You have brought back to us a lost secret—the secret of love, and we are glad, Drake Hillard and Alois Frontenac—we are very glad."

The crew were taking down the thing that had been Nard Devonack. They were wrapping it in a shroud . . . passing it up to waiting hands above that would carry it deep into the hold for storage—or burial—until the return to Terra.

Once more the brain-women were mingling with the crew, forcing them to smiles and badinage, banishing the shock of the awful tragedy so recently witnessed. Some one shouted: "A vote! A vote for the new command!"

"Why a vote?" shouted another. "Drake Hillard, I salute you, my commander!"

"HILLARD! Hillard, we salute you!" Before the unanimous ac-

claim of the crew Hillard could only bow acknowledgment of the honor. He stepped to the ladder where moments before the pride of Terran science had challenged the Arcturian goddesses. Some one spoke to him from behind, and the face of the new commander grew solemn. Silence fell as his hand was raised.

"I have just been informed that there is not sufficient fuel in the tubes to shoot us out of Arcturian gravity," he announced. "But we have sent a message to Terra for a relief ship. Years may pass before we can hope to return, but it seems that we shall have plenty of good company."

"Aye!" cheered the crew.

"Aye, Terrans!" affirmed the melodious voices of the awakened brain-women.

Then the nemesis of Nard Devonack was thrust forward by her sisters. All was still as she answered Drake Hillard.

"Oh, commander, we are eternally your debtors," she said in a voice no longer mechanically intoned, but vibrant with potential tenderness. "During those incomputable eons of our mental evolution we lost the ills and joys of love. You have brought it back to us." She swung to all of them, all the crew. "Take us for your wives, brave Terrans. Let us begin a new civilization where love is the bitter and the sweet, the sense supernal that permeates all life with flavor. All our infinite powers we shall devote to the creation of an ideal kingdom—ideal for you as well as for us. And soon I promise you, we shall evolve the male prototype from the hundreds of us who are still in the brain nucleus, dreaming away the centuries in the darkness of the caves. Perfect in our mas-

tery of the material we have been; now shall we be perfect in our mastery of the life of love, which once we foolishly sacrificed for eternal wisdom."

As the woman ceased speaking, Hillard and Alois saw Arkwright, the compurion who had led one of the details, coming forward with features strangely flushed, and eyes that no longer gleamed with mere ice of intellect. He stopped before the brain-woman who had spoken. He raised his hand.

"I name you Psyche!" cried Arkwright; "Psyche, who seduced Cupid himself in the myths of our progenitors."

"Psyche it is!" a roar of affirmatives responded, and then an orgy of naming was precipitated, the brain-women enthusiastically answering to a variety of nomenclature that would have confused a dictionary maker. . . .

Some hours later, after Captain Hillard had announced that marriage ceremonies might be solemnized by either himself or the second in command, the visual detectors of the interspatial code flashed and crackled with a second message from Terra.

"A ship is being built to bring you fuel for the return to Terra," they decoded. "Be brave and glad, for you have bridged the abyss between stars." And when the detectors were dark again, Hillard whispered to Alois in the curve of his arm: "Until they come we shall live—and love."

"And after," she smiled up at him.

Then they looked from a view-scope of the great space-ship, on the side shaded from the hot glare of Arcturus, and saw that they were not alone in loving.

THE END



The Inner World

By A. HYATT VERRILL

PART I

It is a long while since we had the pleasure of presenting a story to our readers by this distinguished author. It will perhaps be recognized as a departure from the topics of his recent ones which we have given. We know that many of our readers will be delighted to see his name again in our list and we can promise them that there will be no disappointment; the story is so good.

CHAPTER I

Doctor Thurlow's Demonstration

RECENTLY I have received a most remarkable, I might even say astounding, communication. A communication so amazing and incredible that did I not possess the tangible and unquestionable evidence of its authenticity I would not dare to make it public. But as it is, with concrete proofs of the origin of the communication where anyone may see and examine them, I feel that the communication is of such great and universal interest and importance that it should be given to the world.

This astonishing document came to me by the most matter-of-fact and ordinary means—the United States Mail. It was posted at St. Thomas in the Virgin Islands and was accompanied by an explanatory letter which read as follows:

"Dear Sir:

I am mailing you under separate cover by parcel post an object which belongs to you and which I have been directed to send to your address.

A day or two ago, while bathing at Throm Bay, my attention was attracted to a floating object which resembled a small mooring-buoy. It was conspicuously colored with red and white stripes and was of globular form.

Upon securing it I discovered it was not a buoy, for there was no ring at the lower side, and upon lifting it I heard something move or rattle within.

Curiosity now being aroused, I examined the strange object and discovered that it was formed of two sections, and after a little time I managed to separate the two halves which were fastened with a cleverly-designed interrupted screw much like that on the breech-block of a modern gun. At the time I was astonished to note that, although the container was constructed of some metal and was nearly half an inch in thickness, yet its weight was less than that of a similar sized sphere of thin aluminum.

Within this spherical shell was a metal cylinder with a screw cap, and within this was a second cylinder and a sheet of some parchment-like material bearing writing in English, French, German, Italian, Portuguese, Norwegian, Dutch, and several other languages which I could not identify, as well as in Chinese, Hebraic and other characters. As the English, French and others with which I am more or less familiar, were practically identical in meaning I assume that all the others carried the same message, which was a request that whoever might find the object would at once forward it to you at the address I



Everything, regardless of its composition, glowed and rendered itself visible in this strange, almost uncanny place.

have given and that the finder would not disturb the contents of the smaller cylinder.

I have therefore replaced the sheet of parchment and the larger cylinder and am sending you everything exactly as it was when I found it."

The letter was signed "Valdemar Broberg". Naturally I was extremely curious to know what this strange thing might be and to discover who had directed it to be sent to me and why. And when in due course the package arrived I lost no time in unpacking it and examining the red and white globe which was within. I found it precisely as Mr. Broberg had described it, and having learned the secret from his letter, I had no difficulty in separating the two sections. But even though I had been prepared for it, I, too, was astonished to find such a thick, metallic container weighing so little. However, I was consumed with curiosity as to its contents rather than its composition and I quickly opened the tube or cylinder and drew out the sheet of parchment that Mr. Broberg had mentioned.

As I glanced at the writing a cry of absolute amazement came from my lips, and I stared, unable to believe the evidences of my own senses. The writing was unmistakable. I would have recognized it anywhere as the handwriting of my long-missing friend, Dr. Henry Marshall Thurlow! It was a message from the dead. What did it mean? What—With shaking fingers I tore open the smaller cylinder and drew out a large number of extremely thin sheets of some tough, fibrous material, covered on both sides with the same fine, unmistakable handwriting.

Fascinated, enthralled, utterly oblivious of all else, I read the most remarkable and incredible of tales. And now, having explained how this astounding story came into my possession, I must digress

a little and must hark back for three years to a certain evening when I had been seated in Dr. Thurlow's library discussing—as was our wont—various scientific subjects. Thurlow was, as all who have kept abreast of science must be aware, a scientist of most unusual attainments. His discoveries had been many, his painstaking researches had become famous, yet by many of his fellow scientists he was regarded as slightly deranged.

By that I do not mean to imply that anyone ever suggested or even hinted that Dr. Thurlow was insane. No one who knew him could have thought this for an instant. He was, in fact, about the sanest man I have ever known.

BUT it was the general impression that his theories, his discoveries, his marvelous vision of scientific facts undreamed of by others, had become something of an abseesion or monomania and that many of his hypotheses were so iconoclastic, so far-fetched and so fantastic as to be nothing more than visionary dreams or delusions. Personally I never felt that way, and having known him for years—since boyhood, in fact—I was positive that many of Thurlow's theories and statements were made merely to attract attention, to bring about learned discussions and controversies, and that he did not actually believe in them himself.

Still no one could deny that many of his wildest ideas had borne concrete fruit. I shall never forget the time when he demonstrated his claims that light could be preserved indefinitely and could be brought forth when required. "The so-called cold light of fireflies, deep-sea vertebrates and invertebrates and other organisms is nothing more or less than stored light," he declared positively. "We humans deem cold light a marvelous—an unobtainable—thing merely because we

associate all light with heat. Why? Because all our light comes from the sun and is accompanied by heat waves. In order to obtain cold light all that is necessary is to filter the heat waves from the light waves and preserve the latter. No doubt, at the present time, the cost of doing this would be prohibitive, but it can be done, and I'm prepared to demonstrate the fact."

And he did in a most astounding manner. He actually froze light and by so doing eliminated the accompanying heat. Then, by thawing out the frozen light, he set free the cold light. It was a most amazing demonstration, but there is no necessity for describing the process in detail here, nor is it essential to more than mention his other remarkable demonstrations which proved conclusively the accuracy and truth of his deductions and theories. Such, for example, as reproducing the music on a gramophone disc in the form of light and then, by means of a photo-electric cell, transforming the light into sound; starting ponderous machinery into motion by the flash of a pocket electric torch or even by the scratching of a match at a distance, and finally his demonstration of the truth of his assertion that all life, all living tissues, were purely electrical phenomena, and that human bodies (as well as the bodies of all animals and the substance of plants) were nothing more or less than electric batteries or generators, in which the cells were negative and positive, and that in every respect they followed precisely the same laws, the same actions and possessed the same characteristics as an ordinary storage-battery.

All these matters, as I say, have no real bearing on the present story, other than to illustrate the fact that Thurlow was far in advance of his time; that, in innumerable cases, he proved conclusively that his most far-fetched and seemingly fantastic theories were actual-

ities, and that, although deemed slightly deranged in regard to certain phases of science, no one dared prophecy what wild, reactionary and seemingly preposterous theory Dr. Thurlow might not put forth and—later, prove true.

And it was one of these seemingly fantastical, and to me impossible and preposterous theories, that we were discussing in his library on the evening I have mentioned.

"Honestly, you're not serious," I said with a laugh.

"On the contrary, I never was more serious in my life," he assured me. "And you may laugh your head off if you please, but it will not alter facts."

"Facts!" I cried, for I dearly loved to argue with him. "Facts! Why, your statement is absolutely contrary to all facts. You're talking theories and the wildest, most ridiculous theories at that."

"That merely proves you are entirely lacking in logic and common sense," he informed me. "What you call facts are suppositions, claims—I might say excuses—formulated and invented in order to explain matters which cannot be explained by any of your so-called facts."

Thurlow's announcement, made with all the assurance of conviction, that the earth was not a solid sphere but a hollow shell, had brought about the discussion. It was not, I admit, an entirely new or novel idea. I recalled that, more years ago than I cared to remember, the same theory had been advanced by a certain fellow named Holmes, and I remembered how the press and the public had ridiculed him and how "Holmes' Hole" had become a byword and a synonym for anything ridiculous or far-fetched. But for Thurlow to make such a palpably absurd statement was so ridiculous and so far beyond any theory he had hitherto promulgated, that I was convinced that he was joking or that he had made it merely to afford a subject for argument.

Yet now he was maintaining that his preposterous theory was borne out by facts.

"Anyone can make such claims," I told him. "But it is quite another matter to prove them. My own opinion is that you do *not* believe the earth to be hollow any more than I do myself. But as long as you have taken that stand, suppose you attempt to explain the whys and the wherefores of your alleged belief, and also elucidate in regard to the paradoxical statement you just made: that all accepted facts are not facts at all."

"Anyone with common sense, and who stopped to consider the matter, would at once realize the truth and would not require proof," he observed. "Let me ask you a few questions which you should be able to answer with intelligence. When molten matter cools, which portion hardens first?"

"That's easy," I replied glibly. "The outside, of course."

Thurlow nodded. "Precisely," he commented. "And when an object cools, what is the physical result as regards volume?"

"Just as easy as the other," I grinned. "It shrinks—diminishes in volume."

"Right again," he observed. "Very well. Assuming that the earth was once a molten mass and that, as must have been the case, the outer surface cooled and hardened first and so formed a crust, how could the interior have cooled without shrinkage and so leaving a cavity?"

"**B**Y Jove, I never thought of that!" I exclaimed. "But now that I do, I should say off-hand that there *were* cavities—cracks, crevices, holes—rather than one large cavity. I suppose that caves, volcanic craters, earth cracks, faults, etc., are the results of such cooling."

"That's the great trouble with most people—they don't think," he said sarcastically. "And you forget that craters blow outward," he reminded me. "Also, the other cavities you mentioned are merely fissures in the outer crust produced by its shrinkage when cooling. None are of any great depth and the aggregate of all is but a small fraction of the space that must have resulted from the cooling of such a vast mass as the earth. If you stop to consider that our globe is approximately 8,000 miles in diameter, you may perhaps realize what an immense amount of shrinkage must have taken place and what an immense void there must be somewhere within the sphere."

"Not necessarily," I retorted. "Why shouldn't there be thousands—millions, if you please—of small cavities? And besides, why do you assume that the interior *has* cooled? I have always understood that quite the opposite theory was that generally accepted."

"The answer to your last question answers your first," he said. "If the interior of the earth were still molten, the rotation of the sphere would cause the liquid interior to lag behind. It would pile up in an immense wave and would completely upset the world's equilibrium if it did not act like a brake—or rather a counter-balance—to stop the earth's motion completely. And, as I said, that answers your first question also. But wait—I can give you a far better and more convincing explanation by means of a demonstration, than would be possible by means of words."

He rose. "Come into my laboratory," he said.

"There is nothing so convincing as a practical demonstration," he remarked, as he lit a Bunsen burner and placed a small saucepan over the flame.

Then, opening a drawer, he produced a metal sphere about five inches in diam-

eter and an oval board with a deep groove extending around one surface close to its edge.

Glancing at the tin pan, he turned off the burner and opened a small aperture in the metal sphere. "This aluminum globe," he explained, "will represent our terrestrial sphere with its hardened outer surface or crust and this"—he continued, as he lifted the pan and carefully poured its molten contents into the spherical container—"is melted wax, which represents the molten interior of the earth."

As he spoke he closed the aperture in the sphere and placing it in the groove on the board he commenced rolling it rapidly around by slightly tilting the board back and forth.

"Unfortunately, we cannot exactly reproduce the motion of the earth," he observed, "but this approaches it very closely, both in its rotation about its own axis and in its elliptical orbit about the sun. In other words, this aluminum globe filled with molten wax traveling about on an elliptical course and whirling as it goes should produce practically the same physical results as took place when our earth had hardened merely on the surface. And now" he exclaimed, as he ceased moving the board and lifted the sphere, "we will see just what has occurred within the globe."

Stepping to a bench, he threw an electric switch and started a small circular saw with which he sliced the sphere in two.

"There you are!" he cried triumphantly as he handed me the two halves. "You see what happened. The wax hardened to form a fairly thick coating within the outer shell and in so doing left a large empty spherical cavity in the center. Exactly what must have occurred when our old earth cooled off."

"But this is wax," I objected, "while the interior of the earth is mineral—rock. The results might not be the same

with different materials—inorganic ones."

"Quite so," he agreed. "I might have used a nickel-steel sphere and molten sand, but it would have taken more time and the results would have been so similar that you would not have noticed any difference. I know, for I have already tried it. Moreover, I have very carefully computed the extent of shrinkage that must have occurred in the earth. As nearly as I calculate, there is a cavity approximately two thousand miles in diameter within our sphere."

"But surely," I exclaimed, "such a cavity would have been discovered long ago."

THURLOW laughed. "What, with some three thousand miles of solid earth, or rather rock, on every side! How would anyone even guess that such a cavity exists? They might reason that there must be—as I have—but it would not have been 'discovered', as you put it, by accident. But these are all details. The fact remains that, first: the interior of the earth is cold, or at least has solidified, otherwise the rotation and orbit of the sphere would have been affected, and, second, if it *has* solidified, then it contains a cavity."

"Well, suppose it does, what of it?" I demanded. "If it is over two thousand miles deep, it's rather out of reach."

"What of it?" he cried. "Why, that cavity is undoubtedly inhabited. It is my belief that within this earth cavity there is air, water, vegetation, animal life. And I do *not* believe it is beyond reach. I—"

I roared with laughter. "The old Holmes' Hole idea!" I exclaimed. "And explain, please, how plants and animals—even human beings—can exist in a closed cavity without light or heat?"

"Who said there was no light or heat?" he demanded. "Why shouldn't there be both? We receive our light

and heat from the sun. Why shouldn't there be some body that serves for a sun within this cavity? And who said it was a 'closed' cavity? That's not my idea. I believe there is an opening—perhaps several. You may scoff at the old Holmes' Hole theory, but I'm convinced Holmes was on the right track.

"Poppycock; we know there's no hole at either pole. And if there were any such opening, the oceans would run into the cavity and fill it with water."

"They would *not*," he declared positively. "The centrifugal force of the earth rotating at the speed of a thousand miles an hour would prevent any such action, and the same centrifugal force would prevent the water within the cavity from flowing out to the surface of the globe. What do we know about the poles? Nothing. They have been 'discovered'—if a spot which does not actually exist and never is twice in the same place, can be 'discovered'—but there are vast areas in the polar regions that are quite unknown. Besides, they are completely hidden by ice. Who can say what may be beneath the polar ice-caps? And the entrances to the interior are doubtless small."

"Just for the sake of getting your ideas straight, why should there be any opening?" I asked him. "If the crust was the first to cool and harden, why should there be a hole in it? I don't see any in this wax and aluminum affair."

"Of course not," he replied. "In the first place, wax in cooling does not give off any appreciable quantity of gas, but molten rocks and metals may. In the second place, the metal shell we have used is far too strong in relation to the cooling wax, and any gases that might be generated, to permit of its being ruptured. With the earth it was different—the cooling was a gradual process from the surface inward. As the matter cooled and emitted gases, they burst through

the first thin crust and formed faults, volcanoes, caves, blow-outs and fissures; but as the crust became thicker and the outer surface became thoroughly solidified, the gases could not penetrate the shell and they accumulated until they were under enormous pressure. Now, if you will notice, you will see that at the opposite poles of this sphere the wax is appreciably thinner than elsewhere. To be sure it is a matter of merely a fraction of an inch in this case, but magnified to the size of the earth it would be equal to hundreds of miles. That's the solution. Eventually the compressed gases burst through these thin portions of the earth's crust at or near the theoretical poles. It's perfectly plain, perfectly feasible, and is borne out by logical deductions from established facts."

"All right, have it your own way," I told him. "I suppose the next thing I'll hear you say is that you plan to fit out an expedition to explore your inner world. But how about gravitation? How could your cavity denizens keep right-side-up on the walls of their spherical chamber?"

"Gravitation, my boy, is merely the effect of one body upon another, the larger body having the greater effect, and the larger body in this case would be the earth surrounding the cavity, just as in our case the earth beneath us is the larger body. No. I'm not planning to take an expedition in search of this inner world. But I'm determined to try to locate one of those entrances—alone!"

"How are you going?" I inquired, smiling. "Going to bore through the crust and dive in, or do you plan to climb through a volcano, or perhaps you will embark in a submarine and travel under the ice to the Pole and dive into old 'Holmes' Hole.'"

THURLOW smiled. He never lost his temper, no matter how much

anyone ridiculed or jollied him. "No, I haven't planned to employ any of your *very* original devices," he informed me with fine sarcasm, "Such things belong quite properly in the realm of fiction—not in science. Just what plans I have in view I do not care to divulge. But"—very seriously—"I shall not only succeed, but if I find I cannot return—and if I survive—I shall exert every endeavor to communicate my discoveries to the scoffing, hide-bound, scientific world."

"Well, I wish you luck, old man!" I told him as I turned to leave. "Sorry I can't join you, but, until there are through trains, modern steamers or other safe and comfortable means of visiting the earth's interior, I'll confine my tours to the external portions of old Mother Earth. I'm off for Europe in a day or two and I'm rushed as it is. So I fear I shan't see you again before you leave for 'Holmes' Hole'. But I shall most anxiously await a radio or a cable from you telling me of your safe arrival in the vacuous center of the sphere."

He grinned. "Get out!" he cried good-naturedly, throwing a desk-eraser at my head. "Why *can't* you be serious?"

"Never more serious in my life," I cried, dodging a book. "By the way, be sure and take a gun and a camera. I'll watch the Sunday supplements in hopes of seeing your photograph beside a dead something or other slain by you in the earth's center. Good night, old man!"

CHAPTER II

An Amazing Document

THE disappearance of Dr. Thurlow caused little commotion in the world at large. Let a prominent banker, politician, merchant, actor, sportsman, prize fighter or even notorious crook die or vanish mysteriously and the press fairly screams the news

to the world. It will afford ample copy for days and will be discussed by everyone. But when the same thing happens to some eminent scientist, a column at most will be devoted to the event; in a few days it will be forgotten, and the chances are that not one person in a thousand could tell you who the missing man was, what he had done, or any other details. Scientists are regarded as erratic beings at best; they seem to be apart from the common herd and not subject (at least in the eyes of the laymen) to the same rules, reactions and behavior as are ordinary mortals. And when a scientist is in the habit of precipitately rushing off to the ends of the earth, leaving no address behind him nor word of his unexpected return, the public scarcely can be blamed if it refuses to get excited or even interested when said scientist's absence extends for months. So, when my friend Thurlow suddenly vanished and no word of his whereabouts was received for several months, few, with the exception of his friends and some fellow-scientists, paid any particular attention to the matter.

Indeed, even I was not particularly worried or surprised. When I first read of Thurlow being missing from his home and usual haunts (the paragraph appearing in the Associated Press News printed in the newspaper, *El Tiempo* of Madrid, where I was at the time), I chuckled as I recalled his last words to me and remarked to myself that he'd probably gone off to Holmes' Hole. And it was not until I returned to the States after an absence of nearly a year, and found that Thurlow was still missing, that I realized that he actually had vanished as though the earth had swallowed him up. That was three years ago and from that day to the present time no word had come from him, no slightest trace of Thurlow had ever been found.

No one had been able to suggest a reasonable explanation of his disappearance, until I received the strange metal sphere picked up, floating in the Caribbean Sea, and which contained an astounding document in Thurlow's handwriting.

And now, having explained how the amazing communication came into my possession, and having told of the events that took place on that last evening that I was with Thurlow, I will set down the strange tale that was written upon those tough, thin sheets within the cylinder.

"Whether or not you ever will receive this is problematical," he wrote after a few words of greeting. "But as I have released a round dozen of the containers, each with a duplicate copy of this document, I have hopes that at least one may eventually come into your hands. But before I begin to relate my experiences and to describe my present surroundings let me warn you that neither you nor anyone else on your old outside world will believe what I am writing. To you and the rest it will appear too wild and incredible. I will be branded either as a maniac or an outrageous liar. But if skeptics will examine the container and the material of which it is composed, if competent chemists and metallurgists will analyze the metal, I think they, at least, will be convinced that the objects did not come from any known spot on the surface of the earth. But after all it really doesn't make much difference whether anyone believes my statements or not. I'm here and am likely to remain here as long as I live—which I fear will not be very long—and it is, merely, because I am aware of the futility of ever attempting to return to the surface of the earth, that I am taking this means of communicating with you, my nearest friend, and acquainting you and the world with the

amazing discoveries I have made here.

You may remember that on the last evening we were together I expressed my belief that the earth is hollow and inhabited within, and declared my intention of attempting to reach the interior. Well, here I am! How I came here—is of little importance. In fact I can scarcely say myself—it was all too chaotic, too nightmarish an experience to describe lucidly, and, besides, I lost consciousness for a considerable period—I do not know for how long—so I actually do not know myself exactly what transpired. The all-important fact is that the interior of the earth is hollow, that I am writing this within that vast cavity, and that it is inhabited. But such inhabitants!

But wait. Before I attempt to describe these incredible beings let me begin at the beginning and relate my experiences, my impressions and my observations in the order in which they occurred.

My first conscious impression, upon regaining my senses, was of a vast, dim, bluish fog. I seemed to be resting upon a shelf of rock. Close at hand a steep rocky slope rose and vanished in the all-pervading blueness a few feet above my head. On the other side an equally steep slope vanished in an unfathomable blue abyss. It was as if I had been poised in space—a space of a most peculiar, an almost indescribable sort. But it was not until later that I discovered its peculiarity. Though at first it had impressed me as fog, yet I soon discovered there was no mist, the atmosphere being of a deep blue, an almost indigo color, quite impossible to describe adequately. It was like a clear, dark night on the outer earth, if you can imagine such a night with intense blue in place of blackness. But even on your darkest nights there is some light. The moonlight, the faint light of the stars, a dim light from the sky; but here there was

no light, there was no glimmer of stars, moon or sky. Yet the rocks about me were visible, I could see my own body and limbs. The effect was so strange, so weird, that for some minutes I could think of nothing else and remained, seated upon the outjutting rock, gazing at my immediate surroundings. Possibly I can best describe the effect by comparing it to a painting—one of those mysteriously baffling monotone things of blue in which the figures and other objects are merely dim, shadowy forms of a lighter shade. The last feature, I suddenly discovered, was what made it so peculiar. My clothing, my skin, the rocks about me were all blue! Blue of various shades—like an overexposed blueprint, I thought at the time, yet somehow giving the effect of colors. Presently I rose and moved cautiously towards the rocky slope, for I desired to see more of this strange inner world and I realized that I must ascend or descend the mountain side in order to do so. As I rose and moved I made a most astounding discovery. I have said that I seemed to be in a fog, and, as in a fog, near by objects were visible but faded or blurred into the all-pervading blueness a short distance away. And now as I moved I discovered with amazement that the nebulous, lighter sphere about me moved with me!

IT was exactly as if I had been carrying a lantern in a dense blue fog. When I extended my arm the luminosity also extended in the same direction. It was as if my body emitted a feeble glow like that of a firefly. I became intensely interested in this strange phenomenon. I examined the rocks, I experimented, and when I discovered that neither my body nor my hand—when placed close to the rocks or my own person—cast any shadow, when I discovered that there was no lighter, no darker side to any-

thing, I became at last convinced that the glow actually issued from myself and that a similar glow came from the rocks. Drawing my knife from my pocket I tossed it over to the rock several feet distant. The spot where it lay was invisible in the deep indigo darkness, yet the knife was clearly visible as a bluish knife surrounded with an aura of pale-blue light. I tried the same test upon other objects, and always with the same result. Everything, regardless of its composition, glowed and rendered itself visible in this strange almost uncanny place. And the effect was even more uncanny than the place itself. With no areas of light and shade there was no effect of rotundity, no impression of bulk or thickness. Everything appeared flat—as if cut from thin paper.

And neither was there any effect of distance. I found it impossible to say or to judge whether the rocks were within six inches or six feet of my hand. My own feet might have been yards distant as far as I could determine, and I laughed aloud at my clumsy efforts to touch my own limbs at a definite spot. It was exactly as if there were but two dimensions, and for a few moments I was almost convinced that in this remarkable place there was no third dimension. But I soon discovered this was not the case. Thickness could be felt even if not seen (or I might better say appreciated when looking directly at an object) but when viewed from another direction the thickness became visible and I was soon convinced that the whole puzzling effect was the result of light emanating from matter itself. It was a most interesting scientific discovery and I wondered that I had never thought of the matter before, that it never had occurred to me that with all portions of an object equally illuminated the object loses all effects of solidity when viewed by human eyes.

But the discovery that every object—at least every object available to me at the time—emitted its own light, was so much more astonishing and so much more puzzling, that it fully occupied my thoughts as I stepped from my rocky refuge and examined the steep slopes within the radius of my glow. For a space I hesitated. Should I go up or down? What was below, what above the spot where I stood? But it did not take long to make up my mind. If I descended the mountain side and found nothing—or perchance water—I would be forced to reascend. Also, in descending I might at any moment come to an unseen precipice and plunge into space thus ending my explorations forthwith. On the other hand, if I climbed upward and found nothing of interest I could easily climb down again, and I could not fall up a precipice. So, slowly and cautiously—for it was like progressing through a smoke-screen—and testing each rock as I advanced, I climbed upward. I do not know how long I ascended. My watch had stopped and there was no sun, no light to go by, but I should judge it was perhaps an hour before I at last reached what appeared to be the summit. At all events it was a ridge and on the farther side was a second steep slope.

Reasoning that isolated as I was upon a mountain top in a vast impenetrable sea of deep blue atmosphere I was just as likely to find something of interest in one direction as in another, I began descending this new slope. It was quite easy. In fact the difficulty was in not descending too rapidly. Presently, as I slipped and slid downward, I noticed signs of vegetation. I say vegetation, but for a space I did not recognize the things as plants. Indeed, I at first mistook them for some species of gigantic glowworms. Like all objects they emitted a bluish light and they moved slowly about as if

crawling over the rocks. Often, too, they would remain motionless and as if standing upon their heads. In size they varied from a few inches to a couple of feet or even a yard in length, and as they, too, appeared absolutely without thickness, they gave a most striking effect of unreality. With some little effort—for it was impossible to judge their distance from me—I managed to seize one of the smallest of the things and to my utter amazement I discovered it to be a plant! There was no doubt of it.

The structure was unquestionably a vegetable growth. There were roots, a stem—stout and fleshy, now that I held it in my hands—with several coarse leaves growing close to the stalk and with a bud or seed-capsule—I was not positive which. As I held the strange plant in my grasp it actually squirmed—a most unpleasant and repellent sensation it gave me—its leaves vibrating, its stem twisting and bending and its roots, which I now found bore tiny suckers, clinging tenaciously to my hand and exerting no little power as if striving to draw the plant free. Placing the thing upon a rock I watched it with astonishment as it moved, quite rapidly away, by means of its roots, until coming to a crevice, it reared up on end and the folded leaves slowly expanded.

HERE was an amazing phenomenon. A plant that possessed not only the power of independent movement, but which seemed also to possess a vestige of brain power or reason.

Yet, after all I reflected, as I continued my descent, why shouldn't there be such plants? I recalled the sensitive mimosas of the tropics which fold their leaves and shrivel up at a touch or even at the approach of an enemy, real or supposed; I remembered how on one occasion I had conducted quite a series of experiments with these while in the

Canal Zone. How I had, by touching the same plant repeatedly but without harming it, practically "tamed" the mimosa, or rather had taught it, until it actually had recognized me and would permit me to handle it freely without folding its leaves, although it instantly would shrivel and shrink if touched by another person. In fact the results of those experiments were embodied in a monograph which caused quite a sensation at the time. And, after all, was it much of a step from such a sentient plant as the tropical mimosa to a plant which struggled to escape when held? I did not think so. As far as the plants' ability to move was concerned, that ability did not so greatly surprise me. Many of our commonest vines and many ferns, lichens, mosses and other plants climb with considerable rapidity over objects by extending their tendrils equipped with suckers, and literally, even if slowly, walking. The only difference was that these plants within the earth moved more rapidly and carried themselves along as they moved.

SUDDENLY I brought myself to a stop with a jerk. A sudden wild idea had flashed through my brain. Did these walking plants move any more rapidly than the climbing vines etc., on the outer earth? Wasn't it possible—By Jove! I exclaimed, it was, not only possible but probable, logical, I might even say factual, that the whole effect was in my own brain. Coming from the outer world, accustomed to gauging time entirely by the accepted earthly standards based on the rotation of the earth, or by the sun as we put it, my mentality naturally was regulated, as one might say, to outer earth time. But here within the earth, where there was no sun and without even my watch to guide me, all relative time was completely lost. Then, even more abruptly and surpris-

ingly, another thought came to me. The speed of rotation here within the earth must necessarily be less than at the surface. I had no idea what the diameter of this cavity might be, but I had calculated—basing my calculations upon numerous experiments—that it should have an internal diameter of approximately two thousand miles.

In that case (my brain was now working rapidly) the circumference would be approximately six thousand miles whereas the outer circumference of the earth would be approximately twenty-four thousand (I am omitting the exact figures in order to make my explanation clearer and to avoid confusing you with mathematical problems which I know you detest). In other words, the outer circumference would be roughly speaking about four times that of the interior and consequently one complete revolution of the sphere, which would require twenty-four hours or a speed of one thousand miles an hour at the surface, within the earth, would mean a speed of only two hundred and fifty miles an hour! All independent motion within the cavity would be (gauged by outer earth standards of speed) fully four times faster than on the surface of the globe! (as a matter of fact I discovered later that I was greatly at fault in my calculations, as I shall explain further on). Here was a truly amazing condition which I had completely forgotten to take into consideration when making my calculations and planning for my entrance into this inner world. No wonder my descent had been chaotic and nightmarish! The wonder was that I had not been utterly destroyed. At the speed at which I had been travelling I must have accelerated to the speed of a bullet (an outer earth bullet I mean) when I reached the inner space.

Of course now, I reflected, my movements were no more rapid in propor-

tion to the movements of everything else about me than they would have been on the outer surface. But my eyes, my brain, trained, adjusted, accustomed to movement relative to immovable objects were still functioning in the old outer-earth manner. It was all a most novel and a most fascinating theme, and as I once more resumed my descent I longed to be able to get in touch with Einstein and learn if he had ever thought of the matter during his researches and the working out of his relativity theories.

EVEN obsessed as I was in mulling over these newest discoveries in my mind, I noticed my surroundings which of course were most limited visually. Among other things I observed that the vegetation was changing in its character. The moving plants had vanished and all about were weird growths. Had they been of various colors many would have been most beautiful, for their forms were exquisite. But all being of the same pale, luminous blue they gave the exact effect of being unreal, of being mere pictures painted upon a flat blue background and slightly blurred. Some were squat, rounded masses like immense brain corals or more like the Yaretta plant of the Andes, that odd woody plant of the celery family that forms the only fuel in the higher mountains of South America. Others were porous-looking spongy masses. Others rose like giant candelabra. Many were obviously fungi, while by far the greater majority had the forms of delicately-branched corals. And I had quite a shock when, in trying to check my rapid descent, I brought up with a bang against a cluster of these and with a sharp metallic rattle they broke and fell like shattered glass about me. For a moment I sat staring at the things. They were coral! Had I taken leave of my senses or was this the dried up bed of a sea? As-

tounded, I examined the broken masses and whistled. The things were alive. They were not plants but animals; communal masses of polyps covering skeletal foundations precisely as do corals. But instead of being soft, jelly-like and slimy like the coral polyps of the sea, these were leathery, firm and only slightly damp or moist. Needless to say I examined the growths with the most intense interest. Some, I soon discovered, were true plants though in form indistinguishable from the others; many were similar to the sea-fans and sea-rods or gorgonias—flexible, horny, rather than calcareous growths. Still others I recognized as bryozoans; others were unquestionably hydroids. I even found that there were land sponges, while among the roots of the taller growths and the rocks I came upon alcyonarians—sea-anemones—growing there on the bare dry hillside. By this time my mind was in such a whirl that, had I seen fishes swimming through the air about me, had an octopus crawled from under a rock, I should not have been greatly surprised. It was the most remarkable, the most dreamlike sensation I had ever experienced; exactly like being beneath the sea. How, why, I wondered, had it come to pass that forms of animal and plant life which we regard as strictly marine should here be terrestrial? And if such forms of life were found on dry land what forms would be beneath the waters in this earth-cavity? Of course—I laughed at myself with the thought—there might not be water. In that case I'd be in a pretty fix. But I was so intensely interested in my surroundings and in trying to analyze the causes for such a topsy-turvy condition of things that I gave no thought to my future or to my own danger. Very possibly, I decided, the dark blue atmosphere had a great deal to do with the question.

The conditions, as far as light or rather absence of light, were concerned were very similar to those existing at considerable depths below the sea. And—I suddenly realized—deep-sea life was almost universally phosphorescent or luminous, so why not here on dry land? On the other hand—there was a deal of speculation possible here—the aberrant marine growth might well be the result of the sea having dried up. It might be quite possible that through ages of gradual recession of the sea, marine growths had adapted themselves to a terrestrial life. Not until I thought of that explanation did I begin to recall similar examples of life on the outer surface of the earth. I deeply regretted the fact that I was not a skilled zoologist; but I knew something of Natural History nevertheless. I recalled having read a paper by a zoologist friend in which he described a number of species of sea-worms, of ascidians, of corallines and even a few species of holothurians that were strictly terrestrial. I remembered that the common pill-bugs were in reality crustaceans essentially of marine types. There were many species of corals, sponges, hydroids, etc, which were exposed for considerable periods at low tide and felt no ill effects from the air, and in that case it wasn't quite so remarkable as it had seemed to find terrestrial corals, sponges and sea-anemones. Still, I reflected, as I again resumed my down-hill journey, in a land where corals took the place of plants, where alcyonaria were substituted for vegetables, there must be some even more amazing forms of life among the vertebrates, if there were vertebrates here. What a field for scientific research the place must be! What a pity that Darwin, Huxley, Agassiz—the other great naturalists—hadn't known of this strange world! What strong proofs of their theories and dogmas they might have

found! What treatises might be written on the effects of environment upon life, the influences of light, the survival of the fittest and all the rest!

As these thoughts flashed through my mind I uttered an exclamation of surprise and came to an abrupt halt. Among the strange growths near me some large creature was moving about! In the dim, bluish glow of the clustered corals and millepores I could not distinguish the thing's form, and the luminosity of its own body only made it the more confusing. I listened intently and could distinctly hear it chewing, munching something. Very cautiously I drew nearer and peered between the coral stalks. The thing was not as large as I had at first thought. It was about the size of a setter dog, but peer as I might I did not seem able to make head or tail of it.

MY curiosity overcoming all other sensations, and emboldened by the thought that the creature, probably had never seen a human being before, I wormed my way closer and closer, until at last I had a clear view of the beast. And as I did so an exclamation of amazement burst from my lips. Never had human eyes looked upon such a creature. I am afraid it is impossible to describe it, but I will try. In general form I can best liken it to one of those bologna-shaped toy balloons. Depending from it were a number of thin, tentacle-like appendages; at one end were a number of short stout necks, each bearing a pair of powerful horny jaws; at the other extremity were flat, flipper-like organs arranged in a double row, while above the whole was a semi-circular or rounded protuberance bearing six or eight immense goggle eyes, each mounted on the end of a movable stalk. Impossible, uncanny as the thing seemed, yet its actions were even more incred-

ible. Moving slowly about by means of certain of its tentacle-like legs, others of these appendages sought twigs of coral, snapped them off and like hands carried them to the jaws that opened and closed with machine-like regularity, while the stalked eyes on the conning tower (if I may so call it), peered this way and that, as if seeking the most delicate tidbits. The whole affair—I could not bring myself to regard it as an animal—worked with the precision, the steadiness and the accuracy of some mechanical device. I could almost imagine that sausage-shaped body to be filled with gears, cams and wheels, with a sentient, miniature human in the control-room back of the eyes, his hands on levers and switches. Fascinated I watched it. Good Lord! I thought, if all forms of life in the earth's centre were as bizarre as this thing, what might I not find? What would the highest beings—those who corresponded to mankind—be like? As I watched the thing (and you must bear in mind that its unreal appearance was vastly increased by its apparent flatness and lack of bulk) and observed every motion, every action as it browsed its way through the terrestrial coral grove, the true character of the creature began to dawn upon me. It was, I suddenly realized, a communal form of life, a creature in which independent individuals were combined to form a whole, in which separate organisms served instead of organs. Each of the appendages I now saw was, in reality, a distinct animal. Each was adapted to performing one particular function and devoted itself exclusively to that function. Some served as means of locomotion, others served as hands, others did nothing but devour food; the group of creatures upon the top functioned only as eyes while the bulky body no doubt served as the food reservoir, the nerve centre, the circulatory system and

the brains of the entire community. What a marvelous creature to be sure! How unique, how—Dimly, I seemed to remember having read of or having seen something of the sort before. I racked my brains trying to recall it.

Suddenly it dawned upon me. It was one of those pelagic jelly-fishes commonly known as the Portuguese Man of War! Now I had dug the impression from the pigeon-holes of my mind everything came back to me. A world famous zoologist had captured one of the creatures from the deck of a ship and had given his fellow passengers a most interesting and instructive lecture on the marvels of the iridescently colored creature. He had explained how the exquisitely-tinted bladder served as a float and sail, how the trailing tentacles were, in reality, distinct animals each with some certain duty—some to sting, some to propel the whole, some to capture the prey—precisely as the strange creature before me was doing. Good heavens! I muttered, is everything in this earth-cavity a terrestrial form of marine life. If—

Some movement, some sound on my part must have frightened the weird creature. It suddenly ceased moving, the eyes roved about, the jaws ceased to open and shut. Then, like coiled springs, the hanging legs and arms snapped up close to the body, the great jaws drew back into the fleshy necks, the flipper organs were extended and beat the air and before my astounded eyes the creature rose and flew off! For a brief instant I could see it—a faintly lighter spot in the deep blueness. Then it vanished.

As the impossible looking thing disappeared I became aware of a decided thirst and of a keen appetite. Luckily I had provided myself with compact emergency rations, sufficient to keep me nourished for a week. But my canteen, I found to my chagrin, had been in-

jured in my entrance to the strange world and was empty. And as usual, once I found my throat dry and my canteen empty, my thirst rapidly increased. There was no water on the hillside and feeling terrified for fear there might be no fresh water anywhere, and realizing that it would be found at the foot of the hill if it did exist, I hurried as rapidly as safety permitted down the slope. In fact I moved rather more rapidly than safety warranted. Before I could check myself I shot over the verge of a precipice, hurtled head over heels through that impenetrable blue void and landed, with a terrific splash, in water.

But the taste in my mouth, the smarting in my eyes left no doubt as to the quality of that liquid. It was salt! Salt or saltier than the ocean, and with a strange, most horribly disagreeable flavor, in addition, I rose to my feet—the water was barely four feet in depth—brushed the brine from my eyes, spat out that which had filled my mouth, and waded ashore. As I reached the beach or rather shingle, a perfect host of creatures fled from my approach. What they were, what they were like I could not state. All that I could distinguish were the luminous objects scuttling off in every direction like fiddler-crabs on a shore on the earth's surface. Anyway I was not at all interested in anything save my thirst. The terribly saline and ill-tasting water had added to my desire for a drink, and feeling that there must be a stream or a spring somewhere I hurried as rapidly as possible along the shore.

CHAPTER III

The Tss'zor

I DO not know how far I walked nor for how long. I became almost mad with thirst, my eyes smarted, and I stumbled doggedly on my way, inadequately lit by the blue glow from my

own person. Oddly enough the fact that I was emitting a bluish light did not particularly interest nor surprise me. But I assume, now that I think of it, that it undoubtedly was because everything glowed in the same manner so that my own phosphorescence seemed quite natural. Yet I recall that even while stumbling and hurrying along that invisible shore beside an invisible sea I could not help thinking how much I resembled some deep-sea merman moving through the abyss of the ocean. Weird fancies went through my brain. Very vividly I recalled my visit to the Natural History Museum in New York and how Dr. Osborn had shown me the latest additions to the exhibits—marvelously constructed scenes representing the depths of the sea with models of its bizarre denizens, scenes so arranged that when viewed from within the darkened hall I seemed to be in a submarine chamber gazing out of its windows. I remembered how those seeming windows gave on a deep-bluish void much like that in which I was moving; how in that void I had distinguished the dim, ghostly forms of fish revealed by their own luminosity. And even in my extremity, my consuming desire for water, I chuckled as I recollected the sudden astounding transformation that took place when hidden lights were turned on and the grotesque models were revealed in their entity. What would be the effect if some great light suddenly should illuminate this dark world through which I was blindly moving? I tried mentally to picture it, to imagine the weirdly, perhaps horribly, strange denizens I should see.

Terrible thoughts would, however, obtrude themselves. There was every chance that there was no fresh water within the entire interior of the earth. The more I thought of it the more firmly convinced I became that there was

none. Why should there be? Where could it come from? With no sun to evaporate the ocean, with no clouds to condense and fall as rain, how could there be streams? And it was beyond the realms of possibility to imagine that water, from the exterior of the earth, could percolate through two thousand miles and more of solid rock. No, the chances were that I was doomed, doomed to perish miserably of thirst within the shell of the earth.

Then my thoughts took another turn. If there was no sun—as there certainly could not be—and no light other than the luminous glow from every object—how could there be warmth? Yet now I thought of it the place was comfortably warm. Moreover, the air seemed pure; indeed it had a tonic property, as if its oxygen content was higher than in the outer atmosphere. What was to be the end of all this, anyway? Even if I found water how about food? I could not subsist on coral growths nor on those coarse, fibrous walking plants. Even if I could manage to bring myself to the point of devouring those weird beasts such as I had seen, how could I capture them? And if by some miracle I managed to secure both food and drink, what earthly good would result from my wandering about in this dark hole? I could make no observations, could learn nothing of anything beyond the circumscribed area thrown by the light of my own body. And I could not return to the outer world. Of that I was positive. I was doomed to remain here forever, and, I decided, perhaps it would be just as well—and far easier and quicker—if I blew my brains out then and there. In fact I actually reached for my revolver, when a sound from the blueness ahead caused me to halt, motionless, ears straining, heart beating wildly. The next instant I dashed madly forward. It was the sound of falling water!

A moment later I had plunged into a babbling, burbling stream and was lapping up the cool, sweet liquid like a thirst-mad beast.

Lying prone, my mouth and nose in the stream, my eyes within an inch of the water I was oblivious of everything about me. Suddenly a blaze of light seemed to envelop all the world. I was dazzled, blinded. With a sharp terrified cry I sprang up to shrink back, shaking with terror at what I saw.

A few yards distant, silhouetted in the blinding glare of what seemed a powerful searchlight, stood the most fearsome, most impossible of beings. I could not credit my eyes, could not rid myself of the feeling that it was all a dream, a nightmare, or that I had been injured and had lost my mind. Yet nowhere—not even in the brain of a raving maniac or the mind of a sleeping man—had such a being ever been conceived.

Words fail to describe such a thing. No man can properly describe a form, a color, a sound totally unlike anything he ever has seen or imagined. So, although having seen this being—(and by now, having become thoroughly accustomed to it and to others of the same sort)—yet I do not know how I can describe him so that you, my friend, will receive an adequate word picture of what I saw. I will do my best though I fear that to use comparisons with earthly objects is most unsatisfactory. But enough. Let me try.

THE being before me was about three feet in height, but his form—He was neither human, bestial, bird-like, reptilian nor did he in the least resemble a gigantic insect. Yet he was a combination of all. And yet perhaps the most astounding part of his appearance was that, within the circle of brilliant light, he had thickness, bulk and an effect of reality that somehow had been

entirely lacking in the cases of all other objects I had seen. Also, I noted in the brief second I realized this, that the scene was almost the precise counterpart of that I had seen in the museum and had so vividly recalled as I had hurried to the stream—the sudden rendering of dim forms clearly visible. But not one of the grotesque models of those impossible sea-monsters in the museum had been one tenth as grotesque and impossible as the being before me.

Can you imagine a cross between an octopus, an ant, a human being and a bat? I'll warrant you cannot, hence you cannot imagine what the being was like. And in addition he possessed many features which neither the bat, the octopus, the man nor the ant possesses. Like the octopus he had eight legs or tentacles, each, however, was specialized. Some had suckers like those on the tentacles of the octopus; others bore hand-like organs, others were obviously feet, and still others ended in lobster or crab-like pincers. Unlike the octopus whose body is a rather shapeless mass of soft flesh, the body of this creature was segmented, narrow-waisted and covered with a shining, metallic-like armor similar to that of an ant. The head was semi-human in shape, yet the eyes were lidless and many-faceted like those of an insect or rather, I might say, like those of a caterpillar, giving the face the astonishing resemblance to the full front view of a puss-moth larva of gigantic size. Short, stout, muscular arms were attached to the chest or thorax, but these, instead of being free, were connected with the body by membranous wing-like tissue, and I saw—with something of horror—that the arms were folded sharply back upon themselves and ended in extremely long, slender fingers or claws which served as ribs to the membranes exactly like those of a bat. Still more batlike was the short

soft hair that covered the head, the neck, the arms and portions of the wings. But most astonishing and bizarre of all was a long appendage—like the antenna of an insect or of a crustacean—that sprang from between the shoulders and ended in a swollen, bulbous tip from which streamed a brilliant light. All this I took in at a glance while still blinking in the unwonted glare. And at the same time I noticed that, in the light thrown by this marvelous antenna-like organ, the strange creature was brilliantly-colored, that the rocks about were glaring red, purple and yellow, and that my own garments were of their accustomed tints. Oddly enough this came as a distinct surprise, for even in the short time I had been within the earth, I had become so accustomed to seeing all objects of a uniform pale-blue shade that to once again see colors amazed me. For what was perhaps ten seconds we stood there, each staring at the other and—no doubt—each mutually astounded at the other's appearance. Meanwhile the search-light antenna was moving about, turning its light upon me from various angles. Presently a low humming, a peculiar vibratory note, issued from the creature. In a way it reminded me of the sound of a cricket, yet it had a deeper, more resonant tone and I noticed—for I listened most attentively—that it was divided into separate notes, of varying lengths and of distinct degrees of pitch.

I had not the slightest doubt that the being was striving to talk, to communicate with me, and, wondering what the results would be, I spoke, asking who he was, giving him my name and assuring him I was peacefully inclined. At sound of my voice he gave a quick and, I thought, startled step backward and raised two of his tentacles with their murderous-looking nippers as if to defend himself. At the same time his arms partly unfolded and his mem-

braneous wings fluttered as if ready at an instant's warning to take flight. Evidently, I decided, he was a rather timid beast, despite his terrifying appearance, and I gave vent to a sharp whistle.

But instead of scaring him more this appeared to reassure him. He lowered his claws, refolded his wings, and, moving quite close to where I stood, tentatively extended a tentacle which ended in delicate fingers and gently touched my body. I admit that I had an almost overwhelming desire to scream and to leap away. But I managed to hold my ground as the soft fingers moved quickly over my person. And as they came in contact with my bare hand I was astonished to find them warm. The thing was warm-blooded then; he must be a vertebrate!

Somehow the discovery that the being was a warm-blooded vertebrate rather reassured me. If a vertebrate, then he must possess intelligence. For that matter the fact that he uttered sounds that obviously were speech, that he felt me over so carefully, and that he possessed artificial light, all proved that he was intelligent, that he possessed reasoning powers. I wondered if in this indescribably weird creature before me I beheld one of the—I was about to say human—superior beings of the earth's interior; beings who were analogous to man on the outer surface of the globe. Hardly had this thought flashed through my mind, when, to my still greater amazement, I discovered that the light he used was not artificial but natural. That it was a part and portion of his own organism, like the light from a stupendous firefly.

By this time the creature, or as from now on I shall refer to him, the "Tss'zor"—(this being their own name for themselves as nearly as it is possible to reproduce the sounds by English letters)—by this time, as I say, he had

ceased his examination, and apparently being satisfied that I, too, was a warm-blooded, intelligent vertebrate, he spread his wings as if in preparation for flight. Now it is strange, but nevertheless true, that despite my natural feeling of repugnance for the Tss'zor, a repugnance that came very near being dread or terror, I felt quite alarmed at the thought of his leaving me. Somehow the idea of being left alone in that vast abyss of blue darkness, of seeing nothing but luminous pale-blue formless things, of wandering about in the miniature sphere of my own luminosity, was far more terrifying than the Tss'zor, who, despite his fearful aspect, appeared real, almost like a fellow-being in that dream-like, unreal world. But most of all, I think, I dreaded the thought of being bereft of his brilliant light. So, as I saw him lifting those membraneous wings, mad terror swept over me, and unconsciously I threw out my arms and cried out, begging him not to desert. Perhaps it was my gesture, perhaps my tone, or again, perhaps, he had not planned to leave me and merely carried out his original intentions. Whatever the cause, as I threw out my arms and stepped toward him, he suddenly seized me in two of his sucker-armed tentacles. The shock of feeling the snake-like things encircle my body, pinning my arms to my sides, was unspeakably horrible, and I screamed aloud, for I felt certain my last minute had come.

MADLY, but impotently I struggled, expecting each second to see those great scissors-like nippers snap at me, to feel them shearing through my limbs. But I was absolutely helpless, the strength in those tentacles was simply prodigious, and the suckers clung as though glued in place. With a quick motion he drew me close to his hard, shining body, and as, exhausted, I ceased

my cries and my mad struggles for an instant, I was aware of a low, crooning or purring sound issuing from the thorax of my captor. I was amazed. Somehow the lulling comforting sound seemed woefully out of place in that fearsome body. Yet there could be no doubt it was intended to lull my fears, and at the same instant the hand-like organs stroked my body gently, as if the Tss'zor was trying its best to assure me that he meant me no harm. But whether he was friendly or whether I was to be destroyed, I was helpless in his grasp, and the next instant my fears, my forebodings were forgotten in wonder at his actions. With a sudden movement he leaped high in air, spread his great wings, and, carrying me in his embrace, he went sailing off into the blue void.

I cannot hope to convey to you the strangeness of my sensations. Like a living glider (for the wings were never flapped) my captor sped silently, smoothly onward, gradually descending, until with a slight motion, a warping as I may term it, of his wings, he soared upward on a long slant. Nothing was visible save ourselves. On every side, above and below, was that immeasurable indigo void. We might have been alone in outer space, the only living things in the entire universe, disembodied spirits illuminated by the blazing light which, carried at the tip of the antenna, extended far ahead of the soaring Tss'zor and threw its beam of light into the darkness. Possibly you may not credit it, but I assure you that, my first mad terror over, I actually enjoyed my involuntary flight. And by now I had begun to feel confident that the Tss'zor did not intend to harm me; but was in all probability carrying me to some spot where there were others of his kind. And my curiosity to see more of this inner world, to see more of the creatures, and to learn more of other possible inhabitants com-

pletely drove all fear from my mind.

Presently, far to one side, I noticed a faint blur of paler blue like a star shining through a thin cloud. Rapidly it increased in size and brilliancy and suddenly, with what seemed terrific speed, a dazzling light came rushing towards us. I had a momentary glimpse of a counterpart of the Tss'zor that was carrying me; I heard the two onrushing creatures exchange clear, high-pitched musical notes. Then, veering to one-side, passing so closely that I might have touched its wings, the second Tss-zor swept past, and a moment later was a rapidly-vanishing blur in the distance. Soon another of the flying creatures appeared; a few moments later several were in view at once, and presently the place seemed dotted with their speeding lights and their sharp, musical cries came from every side. And as I was borne onward I could not help likening the effect to that of traffic on a foggy night on a motor-highway at home.

Suddenly, ahead of us, I saw a dull, pale-bluish glow that rose in an arc and from whose upper edges shot streamers of multicolored lights. It was like a miniature Aurora Borealis, and I stared at it wondering what it could be, what it presaged. Whatever it might be my captor was heading towards it; on every side I could see others of his kind converging towards the same point. Rapidly the light increased. The dull glow broke up into many separate luminous points, and, almost before I realized it, we were swooping down toward a myriad of brilliant lights. I gasped, I blinked my eyes as the rows and clusters of lights seemed to leap towards us. It couldn't be possible! It was beyond the bounds of credibility! But unless I were stark raving mad or in the throes of delirium it must be—Yes, I could no longer doubt it—We were descending towards a great, brilliantly illuminated city!

CHAPTER IV

In the City

ALTHOUGH at that time I obtained only a brief glimpse, a rather hazy impression, of the city, I now know it so well, that I think it best to describe its principal features before continuing with my narrative.

Along the edge of the sea was a shingle beach, and above this was a broad, high wall, partly natural and partly artificial, that extended in a semi-circle perhaps five miles in length, and which began and ended at a perpendicular cliff that rose back of the city and vanished in the dark upper air. Just back of the semi-circular wall was a broad area or esplanade, and from this, like spokes from the rim of a wheel, a great number of lanes or streets stretched towards the cliff where they converged to a great tunnel-like opening in the cliff which I may liken to the wheel's hub. As this was at an elevation of more than one hundred feet above the sea-wall, all the streets sloped sharply downward. Between these narrow lanes were thousands of buildings; low cylindrical structures with dome shaped roofs strikingly like the "pill boxes" erected in England during the Great War. All were windowless, all doorless, and all were identical to the smallest detail except in one spot where, a short distance from the opening in the cliff, the buildings were of large, I might say immense size, though otherwise like all the rest. At either side of the city, between the last row of houses and the precipice, there was a broad triangular open space which at first glance appeared to be carefully cultivated farms or kitchen gardens. But, as I discovered later, the seeming vegetables were very largely terrestrial zoophytes—corals, sponges, alcyonaria, etc., which had been so altered through ages

of selection, breeding, hybridizing and cultivation that they bore no more resemblance to the wild forms I had seen, than the finest potato bears to the tough and stringy root of the Peruvian highlands. Among these, too, were beds of true plants—mainly fungi and fleshy-leaved growths unlike anything I had ever seen. No, I must qualify that statement; they were unlike any terrestrial plants I had ever seen, but when, in due course of time, I had an opportunity to examine them, I found them all analogous to our marine plants. And here I might as well digress and explain that in this strange inner world nearly all forms of animal and plant life appear to have evolved and developed along absolutely opposite lines to those on the earth's surface. Nearly every marine plant and animal that I have seen is closely related to species confined to land on the outer surface, while practically all those that exist on land here are near relatives of maritime species in your world. There are, however, quite a number which are common to both land and water or are in a way amphibious, and the manner in which Nature has altered or adjusted the structure and organs of these various plants and animals to adapt them to what to me still appears a paradoxical habitat, is most interesting. But of that I will write later.

In addition to the gardens I have described, the triangular spaces also contained pens or enclosures wherein were various weird, grotesque and even horrible looking creatures; the domestic flocks and fowl of the Tss'zors.

But the most striking feature of the city was its illumination. I doubt if any city of similar size anywhere on earth can boast of so many lights. There is one on every house, there are thousands along the sea wall, and although individually they are weak, yet the aggregate gives a

brilliant glare that illuminates the entire city and the sea for several hundred yards beyond the shore, and lights up the cliff-side for fully one thousand feet above the city. Even at my first glimpse of the city, as borne in the grasp of the flying Tss'zor I sped towards it, it occurred to me that it was most peculiar that beings who possessed such powerful lights embodied in their own organisms, should require artificial lights in their city. But this passing thought was submerged in my interest in the character of the city's lights. They appeared to blaze from slender posts or poles, the flames wavering, flaring, darting in and out like the flaming gases from a blast furnace; but with no trace of smoke. Moreover, the flames, instead of being red or orange, were of a clear brilliant white, a dazzling white. But the phenomenon that held my attention was the wondrous play of color (that I had seen from a distance and that I mentioned) hovering like the aurora above the illuminated area. And now when close at hand the display was magnificent beyond words, awe-inspiring in its grandeur. In a vast arch of rainbow-hued light it stretched across the sky above the city, blotting out the sky like a screen of multicolored fire; a wavering, prismatic curtain, giving the city the effect of being beneath an enormous opalescent dome, upon which a thousand colored lights were focussed. Indeed it gave me such an impression of it being a tangible solid thing, that I held my breath as the Tss'zor, with me in his tentacles, rushed straight towards it. I cannot attempt to convey the impression I received as the creature swooped toward that iridescent screen through which, as though viewed through a soap-bubble, I could see the twinkling lights of the great city and even could distinguish—blurred and dimly—the buildings and streets. Each moment I ex-

pected to feel and hear the crash as we struck, to find myself wounded, hurtling down to death. And then a most astounding, a most incredible thing happened. As the light upon the outstretched antenna of the Tss'zor touched that radiant screen, the colors faded and vanished, leaving a great opening, as though it had been of wax and the Tss'zor's light a red-hot iron. The next instant we were through the opening, I saw the flashing, multicolored curtain close behind us. On wide-spread wings the Tss'zor volplaned downward and landed, as gently as a feather, upon the esplanade beyond the city's wall.

As the creature's wings folded, his tentacles released their grasp and I was once more free. Free, yes, but I might as well have been in chains, for all about me, as if conjured from nowhere, were throngs of strange beings. Many were Tss'zors identical with the fellow who had brought me to the city. But others were even stranger, weirder. Some had great unwinking, fishy eyes that occupied nearly the entire area of their flat faces, while their great toothless, gaping mouths gave them an even more fish-like aspect. These, too, were quite distinct from the Tss'zor in other respects. Their wings were almost rudimentary. They had several pairs of arms, their tentacles were shorter and stouter than those of the Tss'zor, and, instead of fur and shining armor, their bodies were covered with gleaming scales. Moreover, while they possessed lights fully as brilliant as those of the Tss'zors, each light was carried on a short tubule projecting from the top of the head. Still others were almost like quadrupeds in general shape, but were naked, pulpy-looking things whose tentacles were small and weak, whose heads—or rather faces—were almost porcine, who did not possess wings, and who had twin lights at the ends of horn-

like processes, much like the horns of a giraffe.

AND speaking of giraffes—there were a number of creatures with such long, attenuated necks, such mild-looking eyes, such vacuous expressions that they reminded me forcibly of those odd African antelopes. But all resemblances ended with the necks and heads. The bodies were seal-like; flippers and tentacles took the places of arms and legs, and the brilliant light with which they were equipped was within a membranous protuberance on the creatures' chests.

All these I took in at my first hurried and terrified glance at the crowd, while strange musical and sibilant sounds almost deafened me. Then my eyes caught sight of two or three totally different creatures, the most exquisitely colored and beautifully formed things I had yet seen. Of course you have seen those ferocious coleoptera commonly called tiger-beetles, so you are familiar with the magnificent, gem-like coloring of their chitinous elytra and thoraces.

Try then to visualize a creature, fully six feet in height, covered from head to foot with a similar jewel-like armor. Try to imagine such a living being with eight articulated arms, with two of these ending in hands of ten digits each, with two ending in tong-like talons, with two more bearing scores of minute wires or setae,* and with the last two terminating in an assortment of digits—no I must say tools—that are like nothing so much as one of those remarkable knives fitted with wrenches, pliers, scissors, gimlets and what not which are so commonly seen on display in the windows of cutlery dealers. Then, having assembled this picture in your mind, stretch your imagination still further and try to form a mental vision of the creature with an

almost human face, with a small mouth equipped with several pairs of jaws, with a parrot-beak nose, with keen eyes glowing with red light, with a high forehead above which, suspended on twin antennae, are lights as brilliant as a motor car's headlights. Then to the whole add shimmering velvety wings, and possibly—possibly, I say—you may have some remote and vague idea of what these things were like.

DESPITE their savage eyes like living coals, and their beak-like noses, which give them a predatory aspect, and despite a somewhat insect-like character that they possessed, still, of all that throng I felt that these were the most sentient beings of all. Everything about them spoke somehow of efficiency, of intelligence and of understanding. And yet somehow I could not overcome the feeling that they were little more than machines endowed with life and brains. But I had little time to speculate on such matters at that time, for in the midst of that crowd of fearsome, nightmarish beings I felt almost sick with terror. To be sure I was armed. I carried two revolvers and a heavy-bladed hunting knife was at my side. Yet I realized that any resistance would be hopeless, merely suicidal. And I must admit that, so far, not one of the creatures had exhibited any signs of hostility. Indeed, their attitudes, their expressions all hinted of wonder and curiosity rather than of enmity. But what was to be the final result? Was I considered a prisoner, a mere curiosity—some strange new beast—or was I deemed a guest, free to go or to do as I pleased?

With no means of inter-communication we were at a hopeless *impasse*.

BUT I was not left long in doubt. Sharp notes issued from scores of throats, the throng hummed like a hive.

*Bristle-like or hair-like projections of various descriptions, growing on insects, birds and mosses.

of angry bees. Pushing and jostling one another, they formed an open lane and in this appeared two creatures wholly different from any of the rest. At first sight I shuddered and could scarcely believe the evidence of my eyes. They seemed two disembodied heads rolling towards me, though as they drew nearer I saw that they actually did possess bodies and legs. But these were so out of proportion that the beings appeared like those huge balloons made in the forms of grotesque figures that are carried and released during parades and carnivals back in your world. And the resemblance was made the more striking by the color of these beings—a rich ruby-red—upon which their features seemed painted rather than molded. Their mouths were merely round holes, their noses were represented by broad longitudinal slits, their ears were huge conical appendages which could be turned in any direction, while their eyes—huge, lidless and staring—were borne on the ends of stalks, and, when not in use, were drawn back or telescoped into deep sockets. Altogether they were the most unreal, the most repellent-looking things I had seen, and as they stood within a few feet of me with eyes extended and focused upon me, I felt as if I were between two dome-roofed observatories and was being scrutinized by inmates with powerful telescopes. Having examined me from every possible angle, the things drew in their eyes and extended slender, delicate tentacles. It was all I could do to control myself as the finger-like, snaky things felt over my person. And when one of them caressed my face I could stand no more, and with an exclamation of disgust I struck it viciously with my hand. Instantly a powerful tentacle encircled my body, pinning my arms to my sides, and, as if in the grasp of a giant python, I was drawn, half-strangled, into the grasp of

one of the Tss'zors for the second time.

Musical notes, sharp hisses, angry sounds filled the air. The big-heads emitted cries that might have issued from the siren of a fire-truck, and there was no mistaking the menacing attitude that every being in the vicinity instantly assumed. I was, I admit, terrified beyond words. I realized that I had committed an unforgivable act and I expected momentarily to be torn to pieces. But instead I was held powerless to move, and surrounded by the angry throng of nightmarish beings, was carried rapidly along the esplanade, around the outer rows of buildings, and was pitched headlong into an enclosure that resembled a bear-pit. Half-stunned I lay there, until suddenly I was aroused by a low, ominous, growling sound. I sprang to my feet and peered in the direction whence the sounds came. And at what I saw the blood seemed to freeze in my veins. Issuing from a black den on the further side of the pit was the most terrible, the most horrifying monster, human mind could conceive. As large as a full-grown bear, with a gorilla-like face, with tiny, wicked blazing eyes and lips drawn back over enormous fang-like teeth, the awful beast was dragging itself towards me by means of small naked feet armed with sharp talons fully a foot in length. For a moment I stood, paralyzed with terror, unable to move or even to cry out. And in that brief moment I noticed that attached to the forelegs were shreds of ragged, bloody membrane. It was some form of gigantic, ferocious vampire-bat rendered incapable of flight by mutilation of its wings! Somehow this realization of the thing's true character galvanized me into life and action. Suddenly I remembered I was armed and, whipping out my revolver, I blazed away at the loathsome beast. With a scream of pain and anger it reared itself up,

waved its crippled limbs helplessly and, pitching forward, rolled over dying.

But I had scant time to note this. At the sound of the thing's frenzied cry, two more of its kind had come charging from the hole.

MY first shot brought one of the horrible creatures down, but before I could fire again the second was almost upon me. Never will I forget the awful terror of that moment. Until my dying day I shall dream of it in nightmares. So close was the fiendish thing that its fetid breath was overpowering, and I actually could look down its livid-red throat as its jaws, with their gleaming, needle-sharp fangs, snapped open and shut within two feet of my face! Only the fact that it was crippled saved me from being seized and torn to pieces. It was impossible for me to retreat, for my back was against the wall, and I felt sick, numb with dread of the result if my bullet did not kill the thing instantly. Of course all this took place in a few seconds, in that immeasurably short space of time that was required for me to swing my revolver towards the beast and press the trigger. But ages seemed to elapse between the two reports of my weapon. And when the shot did ring out, the muzzle of my pistol actually was within the open jaws of the monster, and as he collapsed and fell, lurching forward and bearing me with him to the ground, the pistol was wrenched from my grasp. Screaming, partly hysterical from the sudden relief of my tensed nerves and partly with loathing at feeling the warm, palpitating, furry body, overpowering in its disgusting musky odor, pressing against me, I pushed it violently aside and sprang free.

But the terror I had known before was nothing to what I now felt. The second

giant vampire had not been killed, but only wounded, and now, more vicious, more savage than ever, he was rushing upon me! And my revolver was somewhere out of reach beneath the great dead body of the other beast! For an instant I was stunned with my feeling of utter helplessness. Then I remembered my hunting-knife and jerked it from its sheath. It was a miserable weapon with which to battle with the monstrous bat whose dagger-like teeth were as long as the knife's blade and whose sharp claws were capable of tearing through clothing, skin and flesh. But it was my only chance. The creature was wounded. I had noticed that in their crippled state the things were not particularly agile, and I hoped and prayed that I might be able to dodge the horrible beast's charge and by stepping to one side deliver a fatal blow.

It is hopeless for me to try to describe the next few moments. To me it was a chaos, a nightmare of snapping jaws, lashing claws, sharp metallic squeaks, an overwhelming odor of musk and blood, leaps, dashing, dodging, slashing and stabbing. Again and again I felt my knife bury itself in flesh; again and again the vicious talons reached my garments and ripped great rents in the stout cloth. And then suddenly, with no apparent reason, the great body sank to the ground, rolled over and lay still.

I had won! There was nothing more to fear, and weak, exhausted, I staggered back. Suddenly I felt myself seized from the rear. Something like a great serpent wrapped itself about my body. Mad with terror I shrieked, struggled, and the world went black before my eyes. I recovered consciousness to find myself resting, not in that foul pen with the dead bodies of the giant bats, but in a strange chamber. Above my head was an arched ceiling of snowy-

white material wrought in most amazing, intricate and delicate designs that were somehow strange and yet also familiar to me. Indeed, I was so fascinated by the design that I quite forgot my horrible experience with the bats and did not, for a space, wonder what had occurred or where I was. Then I saw that the walls, too, were of the same pattern and suddenly, as I recalled the strange, cylindrical, dome-roofed buildings I had seen when approaching the city, I realized I must be within one of them. And with this realization came another. No wonder the arabesque-like pattern seemed familiar. The building was of coral. Not constructed of blocks of coral-rock, but cut, actually hollowed out, of some gigantic species of coral. For an instant the idea seemed preposterous, incredible. Then I smiled at my own thoughts. Wasn't everything preposterous, incredible? Wasn't this entire inner world—the Tss'zors, the light screen, all the forms of life I had seen, the city itself—incredible, utterly preposterous? And for a house to be formed by hollowing out the interior of some giant madrepore was perhaps the least incredible and least preposterous of anything I had yet discovered.

MY thoughts were interrupted by a slight sound and, turning over, I discovered I was not alone in the chamber. Seated—no, I might better say squatted—upon the floor was one of those resplendently beautiful creatures with the iridescent metallic armor. Evidently, I thought, I was still a prisoner. Somehow the appearance of the armor-clad creatures had given me the impression that they were soldiers or police, and I even had pictured to myself, what a marvelously efficient police force they would make, if a company of them could be taken back to the world where I belonged. There would be no bribery

or corruption, no graft possible with these fellows, and the toughest gunman or gangster who ever took a rival for a "ride" would be as helpless as a child in the face of these armored and armed beings. So, quite naturally, finding myself alone with one of the chaps, I deemed myself a prisoner under guard. But only for an instant. No sooner did the magnificent creature see that I was conscious, than he rose swiftly, emitted a strange, low-pitched humming sound, moved his light-tipped antennae about. Scurrying to one side of the room, he opened a concealed trap-door, peered into it with his ruby-red eyes and uttered a series of sharp, clicking sounds. Then, returning to within a few feet of where I rested, sitting upright on a most uncomfortable sort of stone couch, he proceeded to gesticulate and utter curiously modulated sounds. Even the most stupid person would instantly have realized the creature was striving to converse with me. But despite the fact that I deem myself anything but stupid, I could make nothing of it. Still it was decidedly embarrassing to sit there and say nothing, so I joined in the conversation, asking the fellow all manner of questions; but, of course, knowing full well that my words were as meaningless to him as his were incomprehensible to me.

But his gestures, or at least some of them, were easily understood. He had an immense advantage, for he possessed eight arms with dozens of fingers—or digits. Of course I could make nothing of much that he tried to convey by means of the movements of his various appendages. But I very quickly grasped the fact that he at least regarded me as a superior being, that instead of being a guard or keeper he was there to protect me and serve me, and that the sudden change in my *status quo* was the result of my battle with the giant bats.

It was then for the first time that I noticed my revolver and knife had been placed within my reach, and very gratefully I at once replaced the weapons in holster and sheath after first reloading the pistol.

Now I stopped to think of it, the flash and report of my revolver would doubtless have amazed and awed the denizens of this inner-world city. But, as nearly as I could determine from my guardian's gestures, there was something more than this and, moreover, the creature appeared to be as much impressed by my knife as by my pistol. But it was not until much later that I learned the reason for this; when I discovered that the use of metals was absolutely unknown to the inhabitants, and that the hardness and keenness of the blade had impressed them as even more wonderful than the revolver shots. But this in a way was not so surprising after all. A firearm was entirely beyond them. They knew of nothing analogous to it, whereas their own chitinous talons, claws, and the implement-like digits on certain classes of individuals were, in a remote way, comparable to my knife.

So engrossed was I in striving to grasp the meaning of my companion's communications, that I failed to note the arrival of another creature carrying a tray-like affair laden with what unquestionably was food. Looking back upon it now, I have to smile as I think what a problem I must have been to these people when I first arrived. They

had not the most remote idea of what I required in the way of sleeping quarters, food or drink. But as each type or caste—there is no word that exactly answers my purpose—as each particular form of the denizens of the city consumed some special form of food and drink, they had tried to solve the problem of my sustenance by bringing me a little of every kind of provender known to the entire community.

THERE were some things which no human being could have eaten, even if on the verge of starvation: pulpy, evil-smelling, jelly-like raw flesh of creatures like giant sea-slugs; gritty, repulsive, gristly meat from some other marine animal; the stringy, rubber-like flesh of actinias or sea anemones. But there were also vegetables which, although raw—for no food is ever cooked in this strange world—was palatable, while shrimp or crab-like crustaceans, the fungi, small snails, and especially rich, tender, terrestrial algae, were all very good.

At last, having dined, I rose, and by dint of signs indicated that I desired to go outside and see the surroundings. My companion seemed quick to grasp my meaning, and lighting the way by means of his antennae-borne lights, he led the way, down through the trap-door, down a winding flight of steps, through a tunnel and so up a steep incline into the outer air and the strange luminous, multicolored glow that illuminated this city of the inner world.

END OF PART I

An Astounding Announcement

This may be termed a story in the order of pacifism and tells how by a most curious concatenation of the fears of nations the entire world is affected. The denouement is quite striking.

By A. L. HODGES

DR. PROTHERO started up the machine. He had been working for many months on a device to break up atoms, and now he was to try it. So, as before stated, he started it going, watching closely what effect, if any, it was going to have on a test tube containing a solution.

Directly in front of the apparatus, and about fifty feet away in the long laboratory, there happened to be a cage of mice which the doctor used occasionally. What was his surprise to hear a terrific commotion in this cage right after turning on the switch. Much annoyed he turned it off and went over to see what had disquieted the animals. When he got there he found them all dead. They had no apparent marks or injuries beyond old scars suffered in previous experiments.

Dr. Prothero breathed a sigh and went in search of his helper to get him to bury the mice. To do this he had to go outside the building. Here another surprise awaited him, for he came upon the dead body of his favorite hunting dog, which also bore no marks. This set the doctor thinking, for the body was still warm. He made some measurements and found that the dog was in direct line with the mouse-cage and the machine which he had started going.

Greatly excited and perturbed, the scientist returned to his laboratory, disassembled his machine and stored it away in his safe, telling no one about it or about his trying it out. He was afraid to go abroad to see what damage the machine could have done. So he sat in his laboratory in a blue funk and waited. He had not to wait long. He heard the cry of "Extra" in the streets, and his assistant came in with an afternoon paper. There, exposed in all its horror, was the story. Twenty-five people and ten animals were found to have been killed at the same instant that morning, the farthest one being fifty miles from the laboratory. No mention was made in the paper that these bodies were found on a straight line that led directly to the doctor's laboratory—but the doctor knew only too well, that he had unintentionally killed twenty-five people by simply turning a switch.

But the possible results of his invention came pouring into his brain, especially should the United States go to war again. He decided that the only thing to do would be to get an interview with the President and to ask his advice.

This did not prove difficult, for the reputation of Dr. Prothero was sufficient to get him a respectful hearing anywhere. The President called in his

advisers. They pondered long. They finally decided to ask the doctor never to divulge his invention, the President assuring him that Congress would settle a sufficient annuity upon him; to further ask that the entire invention should be destroyed; that, however, a complete description and set of drawings should be made by the doctor alone, sealed, placed in an iron safe, the latter's door and doorframe to be welded tightly together, so that there would be no way to open it; and that this safe should be imbedded in a pyramid of reinforced concrete one hundred feet on a side; and that the entire story be given to the press as to what had been done. *only after the concrete had been poured.*

ALL this was carried out; the sensational story became the property of the world. The pyramid was located at St. Louis, above ground, but tunnels were run to it from ten directions fifty miles away. A strong guard of soldiers was placed about it, and the United States breathed easier again.

The world took the thing seriously. Every nation knew that the United States could annihilate them if it chose to do so. Therefore every nation became very friendly to the States. Whenever two nations got angry with each other, all the U. S. had to do to stop all preparation for war was to side with

one of them. In this way the U. S. became arbiter of the world. Soon the nations began gradually to affiliate politically with the United States, and within fifty years of the invention the entire world was under one government, there were no armies or navies, and civilization was so far advanced that children no longer knew that there had been such a barbarous thing as war.

The pyramid still stood, but now, however, only as a monument from which civilization dated its era. Many times there was good humored discussion about opening it and disclosing the secret. Dr. Prothero had long been dead, in fact he had been killed by kidnappers a month after the press story about the affair, presumably because he would not disclose the secret. No one feared the knowledge now.

So they opened it up, succeeding, after much trouble, in finally disclosing the sealed packet. This was broken open with much ceremony, they found only a sheet of paper with the following, in Prothero's handwriting: "There has never been such a machine. I traced each death and found them to be due to other causes. I tried out the machine itself later and found it to be a failure—but I told no one, for I wanted this other and greater experiment in world politics tried out. Maybe it has been when this packet is opened."

THE END



Six-Legged Gangsters

By BOB OLSEN

This is a very attractive story of ant life. The author has given names and special characteristics to individual ants and depicted very cleverly life and adventure in an ant hill. Outside of the personality element, an excellent portrayal of what we may suppose is the life of those strange beings, the highly intelligent ant, is given.

CHAPTER I

Emmet Forebodings

"WHAT makes you think our babies are in danger?"

The individual who asked this question was about as large as a caraway seed. She belonged to a proud race of people whom men call *Formica fusca*, or dark ants, but who, because of their black, glossy armors of chitin, have named themselves "Jetings".

Among her companions, our heroine was known as "Brighty". Mental brilliance, as well as external luster, had won that appellation for her.

Brighty's intellectual superiority was mainly due to her insatiable thirst for knowledge. When not engaged in the engrossing labors of the formicary, she spent as much time as possible interrogating the older and more experienced members of the community.

The "speech" of the Jetings is not articulate, of course. It requires no clumsy devices, such as words, phrases or sentences. Admirably simple and efficient, the language of the Ant People is a sort of gesticular Esperanto, consisting of motions and gestures executed principally by the feelers or antennae.

On this particular occasion, Brighty

was conversing with one of the wisest citizens of the ant city, a solemn-faced worker whose name was Sage.

In response to Brighty's questions, the older ant signaled, "I have good reason for knowing that our infants are in danger. Over our entire city a fearful menace hangs constantly. It jeopardizes all of us."

"What is this peril you fear, and what makes you think it is coming soon to hurt our babies?" Brighty asked anxiously.

"One question at a time, please. I'll answer them in order. The danger—perhaps the only danger we ever need to fear—is from our hereditary enemies—the Big-headed Redlings."

"I've heard about the Redling gangsters, of course. But what makes you think they are coming soon to raid our nurseries?"

"Yesterday, when I was on my way to the harvest field, an unmistakable stench came to my antennae. If you ever smell one of those odorous creatures, you will never forget it as long as you live."

"But if this happened yesterday, why weren't we attacked then?"

"Redlings never start a raid without planning their campaign in advance. The one I smelled yesterday was undoubtedly a spy. By this time she has made her report to the officers of the Redling



She was seated on a pebble with her right front knee resting on her rear thigh and with her tiny forefoot doubled up under her chin.

army. Tomorrow they will be upon us."

Sick with worry, Brighty scampered back to the nursery, where she was employed as a nursemaid. There, laid out in neat, orderly rows, like rolls in a baker's oven, the tiny grubs were sleeping peacefully. How Brighty loved those darling babies!

In the darkness of the underground cavern she could not see her charges, but she knew they were as soft and clean and fragrant as the petals of a white rose.

Had a man peeped inside that nursery, he would have assumed that all these tiny larvae were identical in appearance.

But to Brighty each of them was distinctly different from the others, although all of them were equally beautiful and lovable. Each had its own characteristic odor—each its individual personality. To some of them, Brighty had given names—ingenious names—sweet names—like "Sugar Lerp", "Syrup", "Nectar", designating the things which ants consider most desirable. The choicest name of all she had reserved for a special favorite, whom Brighty had christened "Honey-Dew".

Having cleansed the larvae many times that day, Brighty knew they were all immaculate. Nevertheless, from sheer fondness which she bore toward them, she repeated the operation, licking them all thoroughly, one by one, and massaging their bodies tenderly with her soft, spongy tongue. By their wriggles she knew they enjoyed this fondling, even in their sleep. A few of the babies were still awake, and these Brighty fed with choice droplets of nectar which she regurgitated from her own crop, kissing them as she satisfied their hunger.

Last of all she picked up Honey-Dew in her mandibles and moved her to a spot which seemed a trifle more desir-

able. Then the physical fatigue resulting from long hours of uninterrupted labor conquered her anxiety and she fell into a sound sleep.

Next morning on her way to the food chamber, she met Sage.

"MY dear!" she exclaimed with excited antennae. "What are you doing inside the city at this hour? Why are you not outside gathering food?"

"Haven't you heard?" Sage replied. "Orders have been issued that no ants must leave their premises to-day except the sentinels who guard the gate."

Upon receiving this message, Brighty began to tremble.

"Then what you feared is really about to happen?" she stammered.

"I'm afraid so. The Redlings will undoubtedly attack us to-day."

"But, now that we know this, can't we do something about it?"

"Everything is being done that can be done," Sage informed her. "But there really is little use for us to plan any systematic defense. The result of a Redling invasion is always the same. Hundreds of our sisters are certain to be slain. All our babies will be taken from us. There is no hope of preventing this—absolutely no hope."

"But why not, Sage, dear? Aren't the Jetings as wise and as valorous as the Redlings are?"

"Of course we are, my child. But of what avail are wisdom and courage when those we must fight are so formidable that no other insect in creation can stand against them? We Jetings are an agrarian rather than a military race. Our mandibles are equipped for peaceful occupations, such as herding our cattle, excavating caverns and taking care of babies; but they are unsuitable for warfare. The Redlings, on the other hand, are trained from infancy for military careers. Fighting is the only thing they

know how to do—but we must admit that they certainly know how to fight.

"They are armed with terrible weapons. Instead of being small and shovel-shaped as our mandibles are, the pincers of the Redlings are long and curved, like the sickles which men use to cut fodder for their cattle. Their points are so sharp that they can pierce the toughest chitin armor. One crunch of those awful pincers on a Jeting head and, zip! The brain of the victim is punctured and she dies instantly."

"Is it really as bad as that?" Brighty shuddered.

"Worse!" was the pessimistic reply.

"Now listen, dearie. I know you are a plucky little darling, but don't be a fool. Remember the old proverb, 'It is better to be a live coward than a dead hero.'"

"What do you mean by that?" Brighty demanded.

"Oh, nothing much. After all, I guess there isn't any use for me to give you good advice. You young folks are all alike. No matter how hopeless the cause may be, you will fight just the same, sacrificing your sweet, young lives in futile attempts to protect your baby sisters against an inevitable fate. But perhaps, after all, you are the wise ones and I the fool."

"I don't understand you, Sage, dear."

"Sometimes I do not understand myself. What I am trying to say is this: You youngsters who will insist on fighting when you haven't a chance—you who gladly die for your country—perhaps you will thereby find the greatest happiness. At any rate, you will save yourselves a lot of grief. I often wonder why I keep on struggling myself. Each day I labor from dawn until dusk, and to what purpose? Merely to feed a mess of crawling brats who will either be stolen by the Redlings, or else will grow up, devoting their lives to the useless task of

bringing more babies into the world. What good can possibly come from all this work and suffering?"

"Why, Sage, dear," Brighty signalled. "I've never heard you talk like this before."

"Please forget it, my child. Run along now. Better feed your babies well this morning. It may be their last meal."

"Where are you going?" Brighty asked.

"I have been assigned to the royal body-guard. My job is to help take care of our Queen-Mother."

"But, from what you just said, I supposed you were planning to run away. Instead of that you will have the most dangerous post of all. Isn't that so?"

"Of course not, silly. On the contrary, my post will be the safest in the entire city."

"But won't the Redlings try to destroy our Queen-Mother?"

"Certainly not. Stupid as they are, they have sense enough not to harm her. They know if they let her live, she will keep on laying eggs and soon there will be many more nice juicy larvae in our nurseries for the Redlings to steal."

CHAPTER II

The Scarlet Bandits

BRIGHTY hurried back to the nursery and began to feed the hungry babies. Soon she was joined by several other young ants.

Scarcely had the first round of feeding and bathing been completed when the nurses were startled by tremblings of the ground on which they stood. There was no mistaking the meaning of the vibration. It was the alarm signal! The sentinels at the gates of the city were broadcasting the dreadful

tidings by beating their heads against the walls of the nest.

As if they had been especially drilled in preparation for this emergency, each of the nursemaids snatched up a larva and scampered outside. Fortunately, Brighty was close to Honey-dew. Picking her up tenderly, she joined the procession of ants which flowed turbulently, like a river of ink, toward the only exit of the city.

Around the gateway, the Jeting defenders had already formed a living ring. Gaster to gaster, with their heads turned outward, they waited stolidly for the Redlings to attack. Though the enemy was not yet in sight, Brighty was cogently aware of their nearness. Borne on a gentle southerly breeze, she caught a whiff of an odor which was egregiously noisome.

Rearing up on her hind legs, Brighty peered over the wall of Emmet bodies in front of her.

Soon she could see the bandits clearly. Marching along in serried ranks, they were approaching from five or six different directions.

Like ferocious tigers attacking a flock of defenceless lambs, the scarlet warriors hurled themselves at the pitiful ring of Jeting defenders.

The battle was short and bloody. Before those murderous, sickle-shaped mandibles of the Redlings, the peace-loving Blacks were almost as helpless as their own larvae. Nevertheless, despite their terrific handicap, they gave a good account of themselves, as was vividly attested by scores of red bodies among the hundreds of ebony corpses which strewed the ground a few minutes later.

Under cover of the general confusion, the nurses attempted to break through the ranks of the invading host, hoping despairingly to bear their precious burdens to safety.

Few of them succeeded.

Suddenly recalling the words of wisdom which Sage had spoken to her that morning, Brighty decided that discretion was not only the better part of valor, but of service to her country as well. Instead of trying to run away, she thrust her head, with Honey-dew still grasped in her mandibles, under a heap of dead ants. Gathering her six legs under her she lay there silent and motionless. Over her prostrate body many ruthless feet scampered, but the invaders paid no attention to her, evidently assuming that she was dead.

After a while she stealthily withdrew her head and looked about her. Except for the hundreds of corpses which surrounded her on all sides, there was not a single Jeting in sight.

The fighting had ceased; and the Redlings were swarming into the captured city. Already there was a steady stream of them emerging from the nest, each warrior bearing a larva or cocoon as a trophy of victory.

Slowly and stealthily, so as not to attract attention, Brighty crawled away from the despoiled nest. She had not gone far when her smell organs, situated at the tip of the antennae, told her that she was being followed.

Tortured with fear, she glanced over her shoulder. Two of the Scarlet fiends were chasing her, their terrible pincers clicking angrily. Brighty ran as she had never run before. Luckily she had a good head start; otherwise her pursuers with their longer limbs and more powerful muscles would certainly have overtaken her. Luckily, also, Brighty found a flat stone with a tiny crack beneath it. Through this small opening, she squeezed, carrying her precious burden with her.

For a long while she crouched there, hardly daring to breathe. When the warmth of the stone told her that the sun was high in the heavens, she fed

and bathed her baby sister, and, leaving her snugly sleeping in the shelter of the pebble, crept cautiously out to reconnoiter.

As she came within sight of her ravished home, she saw something that surprised her immensely. Over the battlefield swarmed a large mob of black-coated strangers. They looked exactly like Jetings, but, even at a distance, Brighty perceived that their odor was the same as that of the evil-smelling Redlings.

Her curiosity getting the better of her discretion, Brighty crept closer, until she was only a few steps away from one of the trails over which they were filing. Then she observed they were all carrying tiny, yellowish objects which she recognized as Jeting eggs.

One of these strange creatures became separated from the rest of her companions. Brighty took advantage of this contingency to accost her and engage her in conversation.

At first the black ant with the atrocious smell was decidedly hostile. Dropping the egg she was carrying, she made a savage snap at Brighty's left foreleg.

Instead of retaliating, Brighty sidestepped deftly and, before the other ant could attack her again, she gently tapped out the antenna signal which said, "I am your friend."

"FRIEND!" the other ant exclaimed. "You certainly don't smell like a friend. Why, your body odor is positively disgusting."

Brighty was on the point of informing the stranger that she was suffering from a bad case of halitosis herself. But, realizing that she would never acquire any knowledge by such tactics, she discreetly controlled her temper and replied: "I'm sorry, my dear, that my perfume is distasteful to you. But you must remember that smell isn't every-

thing. Take a good look at me. Notice that my chitin is black and glossy, just like yours. Observe that my head is shaped exactly the same as yours, even to the shovel-shaped mandibles and the graceful antennae."

"Now that you do call my attention to it, you do look a great deal like my sisters," the other creature admitted. "But, really, my dear, you should bathe more often."

"Thanks for the suggestion," was Brighty's response. "I can see that you and I are going to be wonderful pals. Only a real friend would be as delightfully frank as you are, my dear."

Palpably pleased at this subtle flattery, the odoriferous Blackling signaled: "I believe in telling the truth. Unfortunately, most of my companions do not appreciate honesty and frankness. It is refreshing to meet one like you who can take it."

"Thank you, my dear. And, since we are to be good friends, let me introduce myself. My name is Brighty. What's yours?"

"I haven't any name."

"Good!" Brighty signaled with delight. "Then I shall christen you!"

Naming other ants was Brighty's favorite hobby. Like human geniuses, she loved to do the thing she could accomplish well. She had christened thousands of baby ants, but this was the first opportunity she had ever had to name an adult.

"Let me see," she hesitated. "I must find a name that is truly appropriate. Ah, I have it!" Then, with a gesture that was half apologetic, half enthusiastic, she faltered, "Please don't feel offended if I call you—"

"Yes?" the other ant signaled eagerly.

"I hope you won't mind if I call you 'SKUNK'."

"Why, certainly I don't mind, my dear. On the contrary, I am delighted.

I think skunks are charming. I can't tell you how proud I am of my new name."

"O. K., Skunk. And now, I wonder if you will be sweet enough to tell what your unappreciative associates are doing in this neck of the woods."

"Haven't you heard the news? We have just conquered an Emmet nation. Now we are engaged in the pleasant occupation of looting their city."

With inflections of astonishment, Brighty tapped out: "Do you mean to tell me that you and these other evil-smelling—I mean attractive little black ants—actually belong to the same gang as the big, scarlet-hued warriors?"

"Certainly. We live together in a big city about a thousand ant-lengths from here."

"Really?"

"Really."

"Then I assume that you and your companions are transporting the eggs and larvae and cocoons belonging to the Jetings, over to the city of the Redlings?"

An emphatic nod was the answer.

For a while Brighty pondered over this amazing information.

Skunk took advantage of the lull in the conversation to make her toilette. Obviously intent on demonstrating how every self-respecting ant should cleanse herself, she preened and brushed and licked her shining armor with scrupulous thoroughness.

Brighty waited politely for her to complete the job before she asked her the next question: "Do you know what happens to these babies after they have been kidnaped and carried off to the Redling's lair?"

"Of course I do."

"The Redlings eat them, I suppose."

"Sometimes they do. But most of the babies are not eaten."

"Well, then, if the Redlings don't eat

all the babies, why do they steal them from their homes?" Before Skunk had time to answer this question, Brighty asked another one: "What happens to the babies that are not eaten?"

"We nurse them," Skunk told her. "When they grow up, they help us feed the Redlings."

"Why don't the Redlings gather their own food?"

In response to this question, Skunk's antennae quivered with uncontrolled laughter.

"Redlings work?" she tittered. "You must be joking."

"I assure you I am not joking. Do not all ants work? Surely, you are not implying that the Redlings are exceptions to this inexorable law of Antdom."

"If there is such a law, the Redlings have evidently never heard about it."

Moving her antennae so softly that her signals were almost like whispers, Skunk added: "Let me tell you a secret. Those Redlings are nothing but a bunch of lazy, good-for-nothing loafers. Moreover, they are so dumb that they can't even feed themselves. We have to put the food right into their mouths, just as we do with the larva-babies. If we didn't wet-nurse those red soldiers, they would die of starvation."

"Then why don't you quit feeding them and let them starve?"

"And get massacred for our boldness? You have no idea how wicked those Redlings are when they get hungry. They think no more of slaying an insubordinate Blackling than I would of licking my gaster."

During this illuminating conversation Brighty's tiny but wonderfully efficient brain had been functioning actively.

"Now I understand clearly," she said at last. "The Redlings steal our babies, not for food but to rear them in their own nests, forcing them subsequently to

become their slaves. Isn't that the reason?"

"PERHAPS," was Skunk's non-committal answer.

"You don't seem to be very excited about it," Brighty chided her. "Don't you—a member of the proud, liberty-loving race of Jetings—feel ashamed to be called a slave?"

"Not at all, my dear. After all, terms like 'servant' and 'master,' 'slave' and 'free-ant' are merely matters of relativity."

"Just what do you mean by *relativity*?" Brighty demanded.

"Well, to be honest with you, I really don't know. The term 'relativity' is used frequently by the Redlings. It is such a beautifully convenient word and I thought it would fit nicely into the present discussion."

"Nevertheless there may be more truth in your assertion than you yourself imagine," Brighty rejoined. "I've often been told that among the strange two-legged giants which call themselves '*homo sapiens*', the so-called masters are really slaves and the servants are the real masters."

"That certainly is true in the city where I live," Skunk agreed. "We Black ones run the nest just about as we please. As long as we feed the masters well and clean them once in a while so they don't get too dirty, they never interfere."

"In that case you undoubtedly *are* the real masters. And now, my dear, I want to thank you for being so sweet. I shall look forward to swapping signs with you again soon. Good-bye, Skunk, dear."

So saying, Brighty picked up the Jetting egg which Skunk had been carrying immediately prior to the interview, and blandly trotted off with it.

The slave-ant hurried after her, and

frantically tapped out: "Just a moment, Brighty! You are running off with my egg."

Feigning surprise, Brighty said: "So I am. How absent-minded of me! I'm so used to lugging babies around that I did it mechanically. But, after all, my dear, you have been so kind to me that I feel I should do something to express my appreciation. Won't you permit me to carry your egg for you?"

"Why, certainly," Skunk signaled in delight. "Thank you very, very much."

"Oh, don't mention it," said Brighty as she hurried away, not toward the Redling's nest, but in the direction of the pebble where she had hidden Honey-dew.

CHAPTER III

The Golden-Haired Sirens

DURING the ensuing hours Brighty made several trips back to the trail leading from her home to the city of the Redlings. Repeating the tactics which had succeeded so well with Skunk, she intercepted several of the laden slave-ants and adroitly relieved them of their Jetting eggs. In this manner she contrived to rescue nearly a score of the precious infants, secreting them in a snug nest which she excavated herself beneath the pebble where she had taken refuge.

Finally the procession of looters came to an end and the last of the black servants and their scarlet masters disappeared in the distance.

When the beaten roads radiating from the city were striped with the lengthening shadows of the grass-blades, Brighty saw five or six familiar figures crawl disconsolately out of the Jetting nest. She was delighted to recognize one of them as her friend Sage.

Hurrying to her, she greeted her effusively.

"Hello, Sage, dear. I'm so glad to

find you safe and sound. How is our beloved Queen-Mother? Please tell me she is alive and in good health."

"Oh, hello, Brighty," was Sage's perfunctory greeting. "Of course Mother is safe. Didn't I tell you that those unspeakable Redlings know better than to destroy their meal ticket?"

"Oh, I'm so glad! Wasn't it terrible, though?"

"No more so than usual," was Sage's blasé response. "I notice that you came through the battle unscathed. So you decided to take my advice. Instead of helping with the fighting, you ran away, didn't you?"

By the contemptuous manner in which she signaled this question, she indicated that she despised Brighty for following her wise council.

Sensing this, Brighty hastened to defend herself.

"You mustn't think I acted the part of a traitor," she protested. "On the contrary, without wishing to brag, I feel that I have rendered an important service to our illustrious nation. I want to show you something that will make your ocelli pop out."

So saying she led the way to the tiny nest she had carved out beneath the pebble. Crawling inside, Sage was astonished to see one squirming larva and seventeen beautiful, yellow eggs, all laid out in neat, orderly rows.

"My stars!" Sage exclaimed. "This is astonishing! Where in the world did you find all these babies?"

"I didn't find them. I took them away from bandits," Brighty fibbed.

Before Sage could question her any further, she added: "Here, my dear, get busy, will you? Help me carry these precious darlings back home."

As soon as this task was completed, the older ant suggested: "Now you had better see if you can help out in the royal chamber. The Queen's body-

guard is very short-mandibled. Most of us older ones will have to work far into the night attending to the funerals."

Already the small group of survivors who were laboring outside the nest had disposed of nearly half the victims of the battle.

Marked distinctions were drawn between friends and foes. The red corpses were unceremoniously dumped on the refuse heap, while the bodies of the Jeting heroines were reverently stacked in neat, orderly piles, like cord wood.

Delighted with the new task which had been assigned to her, Brighty hurried to the abode of the Queen-Mother which was in the deepest and remotest chamber of the formicary. She had often envied the maids of honor, whose duty it was to feed, caress and shampoo the Exalted-One and to relieve her of the eggs as they issued from her enormous, wonderful body. And now she herself was accorded these incomparable privileges. It seemed almost too good to be true.

For many days Brighty lived a life of unalloyed joy.

With all her other interests, she did not neglect her education. She still made a nuisance of herself by asking questions of all the harvesters, who were good natured enough to tell her about the world outside the Jeting city.

ONE evening, as she waited in her favorite spot at the bend in the main tunnel leading from the gateway of the city, Brighty was delighted to detect a very unusual and delightful odor. Tracing it to its source, she discovered that the fragrance came from a grotesquely formed living creature which Cherry, one of the harvesters, was carrying in her mandibles.

"What's that you have there, Cherry, dear?" Brighty asked politely.

"None of your business!" Cherry

snapped. "You are too young to learn about wickedness and dissipation."

Though this statement puzzled her, Brighty did not pay much attention to it. She was busy exploring the body of the strange creature with her competent antennae. It was about the same length as an ant, but its gaster was much broader. The most outstanding peculiarity of the bug was that it possessed six hanks of silky hair, three on each side of the abdomen.

Brighty noticed also that these hairs were damp with something that had a powerful, aromatic smell. She was about to taste this liquid, but before she could do so, Cherry snatched her prize away, and bore it swiftly into one of the rest chambers.

On the following morning Brighty saw several of the foraging ants acting very strangely. Instead of sallying forth to gather food, they loitered around the nest all day long. Some of them conducted themselves in a most scandalous manner, staggering and stumbling as if they had lost control of their legs. Others sprawled right in the middle of the passageways, sleeping disgracefully with stupid expressions on their faces.

In an effort to solve these mysteries, Brighty trailed Cherry, who seemed to be particularly maudlin and hilarious that morning. It wasn't long until the older ant staggered into the rest chamber where she had left the strange insect the night before.

The guest was certainly receiving a lot of attention. Two ants were trying to feed her at once with choice droplets of nutriment regurgitated from their crops. Six others were licking the tufts of hair which flanked her body.

Brighty was about to join the party when she caught the familiar odor of her friend Sage.

"Oh, hello, Sage," she signalled. "What's going on here anyway?"

"Come away from this sinful resort, my child." As she tapped out this message, Sage's antennae moved so clumsily that Brighty could scarcely understand her.

"I beg your pardon," she said politely. "Would you mind repeating what you just said."

"Get out of here, I tell you! This is no place for an innocent antlet like you."

"But, Sage, dear. How can you talk like that? You seem to have forgotten that I rescued eighteen babies from the Scarlet bandits."

"That's right," Sage admitted shakily. "Know then that yonder disgusting insect is a booze-beetle."

"A booze-beetle?" Brighty exclaimed. "In the name of Heaven, what is a booze-beetle?"

To which Sage replied, "The most terrible curse of all Antdom."

"If that is the case, why are our sisters treating it so kindly?" Brighty demanded. "You, yourself, were feeding it a moment ago."

Evading this accusation, Sage went on, "Just look at what she has accomplished already. Observe those drunken loafers. They ought to be out gathering food and here they are wasting their time and their nutriment in this disgusting manner."

"But, Sage, dear, please explain. Can't you see you are talking in riddles?"

"ALL right, Brighty. You may as well know that the reason why Cherry brought home that beetle last night is that it produces an intoxicating secretion. You noticed those tufts of hair on each side of her gaster, didn't you?"

"Yes, I did. I also observed they were damp."

"That is because of the secretion I just mentioned. The stuff oozes out of

six glands which are covered by the hairs. And by the way, in daylight those hairs are yellow—almost the same color as honey."

"I might have known that the wicked huzzy was a blonde," was Brighty's comment. "But tell me more about this secretion. Does it taste nice?"

"Not exactly. It doesn't taste very sweet, but it has a wonderful kick. It makes one feel light-headed, you know. One or two laps of your tongue over those blond tresses and, whoope! You'll forget you ever had a care or trouble."

"Oh, that sounds interesting!" Brighty signalled excitedly. "I believe I shall try it!"

She was halfway to the booze-beetle, when Sage overtook her and blocked her way.

"Just a moment, my dear," she commanded. "Take my advice and stay clear of that sinful creature."

"Why should I?" Brighty demanded. "Why shouldn't I be a sport—like the rest of you? And what right have you to preach about prohibition? By the smell of your breath and the awkwardness of your gestures it is quite apparent that you have been imbibing rather freely yourself."

"What if I have had a nip or two? You must remember that I am considerably older than you. I can take it or leave it alone. The trouble with you young ants is that you never can learn to do anything with moderation. I don't know what this modern, younger generation is coming to. Now in my day—"

"But why can't I take just one little nip?" Brighty interrupted her. "I only want to find out what the stuff tastes like. What harm can come of that?"

"Harm aplenty. Once you have tasted that vile, accursed poison, you may become a slave of the booze-beetle—doomed to spend the rest of your days in dis-

sipation and debauchery. Better stay away from booze completely."

"But, why?" Brighty persisted. "You yourself admitted that the booze-beetle's secretion makes you forget your troubles."

"Oh, it's all right while the jag lasts," Sage conceded. "But, Lordy! Lordy! Such a headache as one has the next morning. I've been through it all, my child, and I know from bitter experience that the kick you get out of booze isn't worth the hangover."

"Hangover!" Brighty echoed. "What do you mean by hangover?"

"If you want to find out, just run over there and ask Cherry how she is feeling this morning."

Following this suggestion, Brighty approached Cherry, who was lying down at the further end of the rest chamber.

"Good morning, Cherry. How do—"

That was as far as Brighty got. With angry gestures, the older ant snapped, "For heaven's sake, quit battering my head with your clumsy antennae! My poor cranium feels as if an enormous grain of sand was rolling around inside of it. I need an eye-opener. That's what I need."

Whereupon she crawled unsteadily to the popular guest-beetle.

Brighty waited for her to satiate herself. Then, ignoring Cherry's testy demand that she be left alone, she asked, "Why did you do that? If the brew of the beetle makes you feel so badly, why do you drink more of it?"

"That was just an eye-opener, to scotch my beastly hangover," was Cherry's astonishing reply.

"Haven't you heard the maxim that the best way to cure a spider bite is with the hair of the bug that bit you?"*

* I pray thee let me and my fellows have a hair of the dog that bit us last night.—John Heywood, about A.D. 1562.

CHAPTER IV

A Mysterious Conspiracy

THE pernicious effect which the booze-beetle had on the ants who previously had supplied the food for the entire colony almost became a national disaster. To save the community from wholesale starvation, it became necessary for some of the nurses to organize foraging expeditions.

Among those was Brighty.

Although this new task took her away from her beloved Queen-Mother and her equally adorable babies, she welcomed the change none-the-less. Searching for food gave her a wonderful opportunity to gratify her craving for knowledge and adventure.

One day, wandering farther from home than she had ever dared to go before, her sensitive antennae caught an odor which was decidedly unpleasant, but none the less attractive. Her inquisitiveness conquering her discretion, she crept nearer and nearer to the source of the bewildering smell.

At last she came to a narrow strip of cleared ground, which she knew must be an ant-road, carved through the forest of grass stalks by a band of emmet engineers. Creeping close to the trail she was surprised to see a company of ants whom she recognized instantly. They looked like Jeting but their odor was that of the Redling bandits. Nearly a hundred of them passed before Brighty spied the one she was waiting for.

When Skunk finally appeared, Brighty gestured to her, "Well, dearie, what do you know?"

"Now that's a silly question," Skunk snapped. "Can't you think of something more original to say?"

"I'll try," Brighty said meekly. "How are the Jeting babies getting along?"

"Not so hot," Skunk informed her.

"The Redlings insisted on staging a banquet and many of the eggs were eaten. Now we are just as short-mandibled as we were before."

"Does that mean the Redling bandits will soon be making another raid on the Jeting city?"

"Undoubtedly."

"But suppose you were able to obtain a fresh supply of eggs without having to fight for them, would that interest you?"

"Of course it would. But why suggest such an impossible blessing as that?"

"It isn't impossible. I, myself, shall be glad to bring you all the eggs you need."

"But why do you make this offer?"

"Because an arrangement of this sort will be very advantageous to us as well as to you. Every time the Redlings make a raid on our city they invariably slay hundreds of our adult citizens, in addition to carrying off all our babies. By furnishing you with all the eggs you require I shall prevent this needless loss of life, and both our cities will prosper accordingly. Wait for me here."

A short time later, Brighty returned carrying in her mandibles a cluster of ovules resembling a bunch of tiny grapes. Skunk accepted them with profuse thanks and bore them triumphantly into the nest of the Redlings. This was repeated many times until hundreds of the eggs had been transferred from the Jeting city to the home of the red Slavers.

Several weeks later, Brighty again met Skunk and coaxed her for news.

The ebony-hued slave launched into a lugubrious recital of certain lamentable events which had recently happened in the Redling city.

Brighty pretended to sympathize with the slave-ant, but secretly she was highly elated to learn that her ingenious plot was succeeding so well.

CHAPTER V

Into the Bandits' Lair

ON the following morning, the sun was unusually warm, the breezes soft and balmy. It was the sort of day which lures human bipeds to the seashore, the trout stream and the golf course. On the six-leggers of Antdom it seemed to have a similar effect.

A few of the younger members of the colony organized a ball-game, vying with each other in rolling small round grains of sand up and down an improvised athletic field. Others—vain ones—devoted this holiday period to preening and primping themselves again and again. The older and more serious citizens of the Jeting city, gathered together in a large ring with their heads pointing toward the center. Thus assembled, with their antennae linked together to make communication easy, they discussed the social, political and economic problems of the Emmet state.

Though Brighty was much younger than any of the others who formed the counsel ring, she succeeded, through sheer nerve, in crashing into the intellectual circle.

After she had listened (without yawning more than a dozen times), to several dry speeches made by old fogies who either "pointed with pride" or "viewed with alarm,"—after hearing the trite phrase "a government of the ants for the ants and by the ants," repeated at least a dozen times by as many different individuals, Brighty was permitted to make a few remarks. She harangued the assembly thus:

"My sisters, we have heard much this morning concerning the prosperity, which, by the grace of Heaven, has recently come to our fair nation. One thing, however, seems to have been overlooked or ignored by my worthy associates who have discussed our problems during this

conference. We must not forget that prosperity is a matter of relativity. Unless we do something to insure the continuance of good times, this blessed condition cannot long endure. For all we know a depression may be just around the corner."

At this point she was interrupted by several rude signals:

"Shut up!" "Nonsense!" "Calamity howler!" "Throw her out!" and many other exclamations were telegraphed around the ring of crossed antennae.

It was some time before she was able to secure the attention of the community again. Finally, she succeeded in doing this by gesticulating vehemently, "You seem to have forgotten the Redling bandits!"

This made them all stop and give heed.

Brighty took advantage of the lull to hurry on with her speech: "I observe that the mere mention of that hated name is enough to strike terror into your souls. But do not worry, my sisters, I have good news for you. Perhaps you wonder why the Redlings have not made their usual raids on our city recently. I will tell you. They haven't attacked us because they were prevented from doing so by me."

"By you!" someone signalled with gestures that were obviously meant to be scornful and derisive.

"Yes, by me!" Brighty insisted. "Moreover, I have mapped out a plan which will enable us to eliminate the menace of the Redlings forever. If you will help me, I shall show you how we can wipe out the Redling city completely and thus insure eternal prosperity for our great nation."

"All right! Explain your plan!" one of the senior counselors commanded.

"Instead of waiting for the Redlings to raid us, let us attack them in their own homes and destroy them completely." Brighty gestured.

This preposterous suggestion was greeted with wild excitement. Nearly all the members of the circle tried to signal at once and the result was just a confused chatter in which only a few isolated phrases could be distinguished, such as: "Ridiculous!" "How silly!" and "She must be crazy!"

After waiting patiently for the excitement to subside, Brighty gesticulated, "No! I am not crazy; and my plan is *not* ridiculous. On the contrary it is ridiculously feasible. If the Redlings were in normal health they would of course fight back and we wouldn't have a chance. But right now they are not even able to defend themselves."

"What?" someone cut in. "Do you mean to tell us that all the Redlings are sick?"

"Not exactly sick," she replied. "Let us call it incapacitated. However, I can assure you positively that they are as helpless as larvæ. If you don't believe it, follow me to the Redling city. I promise you that I shall enter it alone and drag one of the scarlet bandits outside so that you can inspect it in safety."

This declaration was following by a tremulous antennal laughter. Undaunted by this open derision, Brighty exclaimed, "Laugh if you must. But if you want to see some fun—follow me to the Redling city."

Whether the Emmet counselors had become convinced by her deadly earnestness or whether they merely accompanied her out of curiosity, the fact remains that they accompanied Brighty until she reached the clearing which marked the boundaries of the Redling city.

Obviously dubious, they watched her as she scampered jauntily across the Redling's yard and disappeared through the gateway of the bandit city.

Turning to one of her companions, Sage signalled, "Too bad. She was such a cute little grub. An awful nuisance,

but I shall miss her nevertheless."

She had hardly completed this message when she saw a shiny black object wriggle slowly through the gateway of the robber city. It was Brighty's gaster. She was emerging in reverse, dragging behind her the enormous body of a Redling warrior. By the convulsive motions of its upturned legs, the astonished audience could tell that the bandit was alive, although it was quite evident that she was either stupefied or seriously wounded.

Before the astonished eyes of her frightened sisters, Brighty leaped upon the creature and neatly gnawed the monstrous head from the scarlet thorax. Picking up the severed head in her mandibles she flaunted it in the faces of the ants that surrounded her, driving them almost frantic with the abominable stench of it.

"See how easy it is?" Brighty exulted. "Now let us slay the rest of the kidnappers! Kill every last one of them! Wipe out this den of crime and iniquity! There are thousands of the criminals in there! They are all as helpless as this one! Follow me and kill! KILL! KILL!"

THE effect of this inflammatory message was magical. Their antennae quivering with murderous gestures, the band of Jetings followed their intrepid leader through the portals of the robber stronghold.

The massacre which followed made the Redling's raid on the Jetings seem tame by comparison. Crazed by the infuriated odor of life-fluids which gushed from the bodies of their victims, the invaders were not content with decapitating their enemies. They literally tore them limb from limb.

Despite the confusion, Brighty managed to get the attention of Sage and a score of other elders whom she organized into a special detail.

"We must not overlook the most important task of all," she admonished them. "We must find the Redling's Queen-Mother and slay her. Otherwise she will give birth to thousands of other Redling warriors, who will some day avenge this massacre."

After a diligent search, Brighty and her small group of followers finally located the Royal chamber which was craftily hidden in a remote portion of the formicary. Here they encountered formidable resistance. The enormous egg-machine which they sought to destroy was surrounded by a band of intrepid, savage and sober guards.

Like human Berserkers of old, each of them fought with the strength and fury of a dozen ordinary soldiers. But the invaders were equally valorous, and they soon slew all of the defenders. Then they fell upon the helpless queen. In a few seconds they had torn her bloated body into a thousand shreds. Thus did the Jetings win a glorious victory!

CHAPTER VI

The Mystery Explained

THE following morning, after a long search, Sage found Brighty in one of the remote, abandoned chambers of the formicary. The youngster had assumed an extraordinary attitude. She was seated on a pebble with her right front knee resting on her rear thigh and with her tiny forefoot doubled up under her chin.

"Good morning, sister dear," Sage greeted her.

"Oh, good morning," Brighty signalled in an abstracted manner. "Please don't disturb me. I am thinking."

"So I perceive," said Sage. "But would you mind interrupting your cogitation long enough to answer a question or two?"

With a patient sigh, Brighty replied, "Very well. What's on your mind?"

"Ever since yesterday afternoon," Sage rejoined. "I've been wondering how you knew the Redlings were in such a condition that they could easily be slain."

Brighty astonished her by declaring, "It was I who got them in that condition."

"What on earth are you talking about, my child?"

"Do you remember the booze-beetle which Cherry brought into our city some time ago?"

"How could I forget her?" Sage gesticulated. "I get a pain in my cranium every time I think of this sinful creature. What about her?"

Brighty went on, "After all the drunkards had checked out, the booze-beetle started laying eggs. The other ants were too stupefied to notice this. But I remembered what you told me about the evil effects of intemperance. Fearing that the children of the booze-beetle might have a contaminating influence on our Emmet younger generation, I removed the eggs and transported them to the home of the babystealers. There I talked one of the slaves into carrying the booze-beetle eggs inside the Redling city. The dunce actually thought they were Jeting eggs."

"Then what happened?"

"Thinking they were ant eggs, the slaves naturally took care of them in the Redling nurseries. Subsequently they became mature booze-beetles. There must have been several hundred of them."

"Now I am beginning to understand," Sage exclaimed. "With all those booze-beetles on the job, the Redlings soon drank themselves into a helpless stupor."

"That's right," Brighty assented. "And now if you don't mind, I'd like to go on with my thinking. I have a very seri-

ous problem to solve."

"Won't you tell me what it is?" Sage pleaded.

"Very well. As you know, our blessed Queen-Mother is in the habit of laying thousands of eggs each day. This is a mighty good thing during the times when the Redlings were making periodic raids on our nurseries. But now that the men-

ace of the Redlings has been removed, I fear we shall soon be confronted with a serious problem of overproduction."

"And what do you propose to do about that?" Sage asked.

"I don't know yet," Brightly replied. "That's why I'm thinking so hard. I'm trying to figure out a system of birth-control!"

THE END



Science Questionnaire

1. What is the temperature of space assuming it to be at the absolute zero? (See Page 24.)
2. What is the approximate distance of the sun from the earth? (See page 27.)
3. What is the distance of Arcturus from the earth? (See Page 44.)
4. Describe the star Arcturus. (See Page 45.)
5. How can Arcturus be identified in the sky? (See Page 45.)
6. What is a famous characteristic of the planet Jupiter? (See Page 58.)
7. If there were a hole opening into an interior cavity in the earth, what would operate to obstruct the flow of water into it? (See Page 75.)
8. What is the approximate speed of rotation of the earth at the equator? (See Page 75.)
9. What is a seta? (See Page 91.)
10. What is a madrepor? (See Page 94.)
11. If a plane could rise and part with velocity imparted by rotation of the earth, what would its virtual speed be when over the equator? (See Pages 120-121.)
12. What is the name of any new and different plant obtained from a standard parent plant by various treatments? (See Page 122.)
13. If seed is produced from two plants, varying one from the other, what is to be expected from its growth? (See Page 124.)
14. How has the ginkgo tree been characterized? (See Page 124.)
15. What is fox-fire? (See Page 131.)
16. What is slime-mould? (See page 131.)
17. What is the odor of hydrocyanic acid and what is its formula? (See Page 133.)
18. How are the three emanations of radium designated? (See Page 143.)
19. What are alpha radiations? (See Page 143.)
20. What are beta radiations? (See Page 143.)
21. What are gamma radiations? (See Page 143.)
22. What is the Heavyside layer? (See Page 143.)
23. State the velocities of the three emanations of radium? (See Page 143.)

170 Miles a Minute

By WARD SKEEN

The classic of Jules Verne of "Around the World in Eighty Days" will read very strangely compared with a story about the speed of travel of 170 miles every minute. We are sure that this story of airplaning will please our readers and meet with their approval, but the day is far distant when an airplane speed of over 1,000 miles an hour will be considered practicable.

A PRIZE OF \$100,000 IS OFFERED BY ADOLPH DOLT TO THE FIRST AVIATOR WHO MAKES A NON-STOP FLIGHT AROUND THE WORLD.

Paul Plake stared at the lines fascinated. Here was the culmination of a life-time ambition. Since his early childhood he had been inventing things.

For years now he had been centering his study on aviation and felt that he had many valuable ideas, but he had little money and could not develop the ideas and try them out. So the exceptionally large prize offered in the "Around the World Flight" fired his ambition and set him to thinking.

The closing date for the flight was just six months away. Much could be done in that time with money, but without funds nothing could be accomplished. Young Plake decided on a bold plan. In a large city about a hundred miles from his home lived James Goode, well known capitalist and philanthropist. Paul decided to see Mr. Goode and try to interest him, so that he would finance his attempt to win the prize.

With his imagination working at double quick time the young man set out for the city. In four hours he had

arrived there and parked his car. He had his "best" shoes polished, then hurried to the Goode building where the offices of the capitalist were located.

Consulting a directory he soon found the floor on which the offices were located. An elevator whisked him to the right floor, but left him almost breathless, for he was not used to riding in the modern high speed time-savers.

As he neared the office his self-confidence grew fainter and he entered the door hesitantly.

"Can I do something for you?" asked the efficient looking girl at a desk.

"I want to see Mr. Goode." He swallowed an imaginary something in his throat.

"Sorry, but Mr. Goode is in conference and cannot be disturbed."

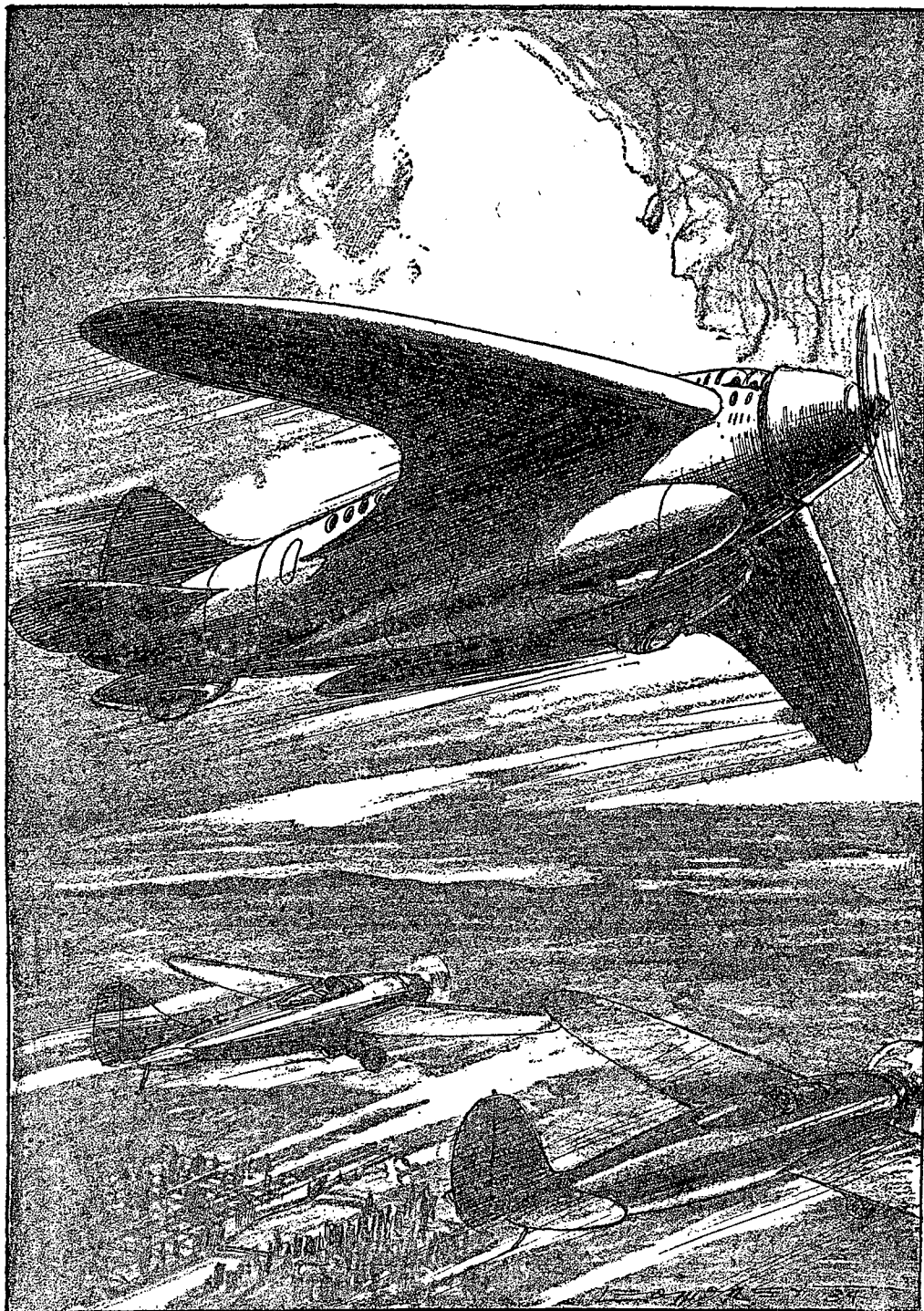
"But I want to see him very much," blurted out the young man.

"Have you an appointment?"

"Why, no. I just came to town."

"You can leave a message and I will give it to him," suggested the girl.

Plake stood there undecided what to do. By this time enthusiasm had ebbed very low, and he wondered if, perhaps, his ideas were wrong, and he should not ask someone to put their money in to develop them. Just then the door



With a short run "The Hopelite" lifted and made its way up into the heavens, out of sight.

marked "Private" opened. Paul recognized the capitalist at once, for he had seen the man's picture in the newspaper many times. Goode paused and looked inquiringly at Plake.

"Do you wish to see me?" Plake felt relieved, and his confidence came surging back as he looked at the kindly face of the wealthy man.

"Yes sir, if I could." Mr. Goode was used to having visitors call without appointments, as he was well known and well liked by all classes.

"Just come inside, please. I am very busy, but I always try to spare a few minutes to every one." Mr. Goode motioned Paul into one of his private offices.

"Now, young man, what can I do for you?" The pleasant smile and friendly voice caused Plake to lose most of his diffidence.

Displaying the newspaper with the large headlines of the coming flight, Paul asked,

"**H**AVE you read about the big prize offered by Mr. Dolt?"

"Yes. And while I believe in developing aviation as far as possible along safe and sane lines, I cannot see where Mr. Dolt's prize is going to benefit aviation or add to our knowledge along that line. Airplanes have covered the route several times, and I believe have charted the course thoroughly."

"To a certain extent the route has been charted," answered Paul, "but this flight is a speed contest to see who can make the greatest speed and keep it up until he has gone around the world."

"Quite so, and the winner will be the best equipped, making the trip more a result of careful preparation than of any radical new ideas in aviation."

"Right there I beg to differ with you. I think new ideas will be brought out, enabling planes to circumnavigate the

world from one sunrise to another," argued Paul.

"Well, perhaps you are right, I am not in a position to say. But I am not sufficiently convinced to see my way clear to finance a plane for the flight."

"Why, how did you guess?" asked Plake in surprise.

"My dear boy, you are the fourth young man to call upon me since Mr. Dolt posted the prize money. Each and every one of them felt that he could win the prize easily. Such is the confidence of youth. I am really very busy this morning and can't give you any more time. Call in again some time and let me know how you are progressing."

Paul walked to the elevator, hardly seeing his way. He had planned so much on just how he was going to approach the capitalist and gain his confidence, then explain the plan fully. But not now. He had made a flop of it. He had not spoken one word to Mr. Goode of his new and radical ideas of aviation. He felt that the capitalist thought him a nut. The young man wanted to kick himself as he walked to his car.

For several days after he returned home Plake felt that he had not given his ideas a fair chance. He planned in a hundred ways in which he could get the attention of Mr. Goode, but rejected them all as visionary or plain foolish.

One of the most important things in his plan, and he felt it would go farther than any other single item toward success in the world flight, was a light metal he had invented.

HE called the metal Hopelite. For he was basing hopes of a brilliant future upon this discovery.

He cast a good size piece of the metal, and taking plans of the plane he wanted to build Plake set off again for the city.

This time he was better prepared to convince Mr. Goode. He hurried into the elevator and bounded from it into the Goode offices.

"Is Mr. Goode in?" he almost shouted at the girl.

"Yes, but he did not mention an appointment at this hour."

"I must see him at once," Plake pushed open the door without ceremony and entered Mr. Goode's private office.

The capitalist was leaning well back in his chair with his hands clasped behind his head, his feet resting comfortably upon his desk, his coat off and shirt sleeves rolled up above his elbows. He smiled as Paul entered.

"Well, young man, you caught me loafing my time away, but I like to be just as comfortable as possible these hot days. I was just thinking over my care free boyhood days and wishing that I might set the calendar back to that happy time just for one day. That is, just for me alone. Of course the rest of the world might not care to have their time turned back.

"I see you have some papers. Diagrams no doubt of the plane you have in mind. Draw up that chair and tell me about it. For once I am not busy and, while I do not promise to fall in with your plans, I will listen."

Overjoyed at this opportunity, Paul began enthusiastically:

"First and foremost is this metal that I have invented. I named it 'Hope-lite,' for on it all my hopes are based. The motor and every thing in and about the plane, as well as the plane itself will be made from this metal."

Plake held out his hand with the metal on it. It fell like a piece of cotton wool slowly to the table.

When Mr. Goode saw how light the metal seemed, he sat up with a start. Reaching out his hand, he picked up the

metal several times and found it marvelously light.

"I must say that is quite the most remarkable metal I ever saw or heard of," exclaimed the capitalist excitedly, "have you got a patent on it yet?"

"No sir. I have not been able to spare the money just yet," frankly confessed Paul.

Walking to the door, Mr. Goode called to the girl on guard in the outer office, "Do not allow anyone to disturb us." He returned to watch the metal again. He moved the electric fan several times to test the result of the breeze on the metal.

"Boy, that invention is worth thousands. I will furnish you the money and you must get the application papers filled out at once for a patent. That is too good an invention to take chances on. Now what else have you in your magic bag?"

"That metal is a reality, an established fact," began Paul as he drew forth his plans, "the rest that I will show you is mostly theory, but I have all the faith in the world that the theory will prove out."

For two hours Plake explained with words and by pencil, his plans, and how he hoped not only to win the Dolt prize, but to revolutionize long distance air travel.

"BOY, that is radical, very radical," exclaimed the man, when Paul had finished his explanations, "and yet if some one a hundred years ago had told of Lindbergh's flight across the Atlantic, the wiseacres would have sent him to the insane asylum. How much do you need to build a plane and try out your theory?"

"Oh, I think \$50,000 will be needed, but understand, Mr. Goode, if we get the prize I will repay you in full. And if we do not get the prize, I will give

you one half interest in Hopelite," offered Paul.

"As to that, I really don't care so much for money as you might think," answered Mr. Goode, "but I want to help you to try this thing out. Come with me." They descended to the first floor where Goode did his banking business. Calling the cashier, he introduced Paul and stated,

"Mr. Plake and I are going to experiment a little. He thinks he will need \$50,000; he may need more, but whatever amount it is, you see that he gets it, and charge to my account."

"Very well, Mr. Goode, we will take care of him and honor all checks."

Those arrangements attended to, the capitalist turned back to Paul.

"Now, young man, I am going to make just one stipulation. I want to help you work on the plane; I have always loved to work on machinery. And I want to go with you when you make the flight. Now you are at liberty to use anything and everything that you need to get the plane ready in time, regardless of expense. Good bye, until you need a first class mechanic, then call on me." He smiled and clasped Paul's hand warmly.

The young man hurried home. At last, he repeated to himself, he could now try out his theory.

The next few weeks were very busy ones. Thousands of details, so it seemed to Plake, required attention. Many difficulties came up that he had never thought of, but at last he had things going smoothly.

A patent on the hopelite metal had been applied for, and a sufficient amount of the metal had been manufactured to build the plane. Then the real work started. Paul hired a large number of expert airplane mechanics and started to work to make it tick.

When the work had progressed this

far, Plake communicated with Mr. Goode who immediately made arrangements to leave his office. When he appeared at the machine shop he was provided with a pair of overalls and the necessary tools. The mechanics soon learned to appreciate his ability and praised him highly.

The work progressed rapidly, and in a few weeks the machine gradually began to take on the appearance of an airplane, an all metal machine with about sixty foot spread of wings.

At last the plane was complete and the mechanics pronounced it ready for a trial flight. After a careful checking up of all parts the oil and gas tanks were filled, the motor started and allowed to idle for a time. Paul, anxious to try it out, could hardly wait to get into the cockpit. Goode climbed in also and they were off.

The take-off and lift were remarkable, due to the lightness of the metal. A tremendous shout burst from the crowd of mechanics as the plane soared away. The trial flight lasted perhaps fifteen minutes, Paul made a perfect landing. Instead of the machine hitting the earth hard and bounding along it settled down rather slowly and gracefully due to the weight of the fuel and the pilot and passenger.

"I believe that metal will revolutionize the plane industry of the world. The machine handles easy and rides like a feather bed," exclaimed Goode as he leaped to the ground and grasped Paul's hand joyously.

FOR several days they continued to try the machine out, making a few minor adjustments here and there as the tests developed the need for them.

Paul christened his plane "The Hopelight" and entered it in the Dolt contest.

Early one morning with the start of

the contest still six weeks away, Paul set out for a short flight. The gas line broke and allowed a flow of gasoline to fall upon the red hot exhaust pipe. As it burst into flames, he leaped from the burning mass opening his parachute as he cleared the machine.

Landing safely, he stood and watched the machine as it was destroyed by the fire demon. The gas tanks exploded making the plane a total wreck.

A choking sensation gripped the boy; several tears trickled down his cheeks as he stumbled blindly toward home, unconsciously going to his mother who would comfort and encourage him in his loss and disappointment.

It took him perhaps an hour to get control of his emotion so that he could call Goode and tell of the loss.

"Mr. Goode, the—our—plane burned up about an hour ago. It is a total loss—" the youth choked and could say no more.

"What! Oh, I say, Paul, that is too bad, really too bad. But we cannot stop now you know, boy. Get your crew together and start right away on a bigger, better plane than you had before. We will just have to see this thing through. Brace up, I'll be right out to help you."

Four hours later the capitalist's car rolled into the Plake yard, Goode greeted Plake affectionately. For several hours, the two men kept the telegraph wires busy with orders for materials, and engaging mechanics.

The second day after the wreck they were busy again on another machine. From that time on they worked day and night. Most of the mistakes of the first machine were eliminated. Then too, a larger crew of mechanics were at work, so that in a week the machine showed strong, rigid outlines. In two weeks most of the superstructure was complete. Three weeks found them putting

in the motor with prospects of being able to give it a tryout in another week.

At the end of the fifth week after the accident, Paul was again trying out a plane. This one was larger and better than the first one. All of the controls and instruments, as well as sleeping quarters, were inside a large glass case. This case was provided with pressure gas heaters to keep the pilot and passengers warm at extreme altitudes.

The motor, fuel and oil tanks were also inclosed in a warm compartment so that even in the most severe cold the motor would continue to run, and the oil and fuel would flow freely.

Tanks of oxygen were provided for the pilot and passengers to use in the rarefied atmosphere of extreme altitudes.

The second machine proved to be all right in the tryouts. Paul and Mr. Goode made many flights together and developed a comradeship that lasted the balance of their lives.

THE Dolt flight was to start from Omaha, Nebraska, the fliers to have the privilege of going either east or west around the globe.

Plake and Goode landed in Omaha two days before the start of the flight, they had entered the second machine as the first, "The Hopelite." There they checked over the plane carefully and made all plans for the flight.

All was hustle and bustle at the flying field the morning of the grand take-off. It was freely predicted that endurance and mileage records were going to be broken by the intrepid flyers entered in the race.

Paul and Mr. Goode, bundled up in great sheepskin, electrically heated suits, entered their glass inclosure. The mechanics signalled them to go. With a short run "The Hopelite" lifted and made its way up into the heavens, out of sight.

Cables and wires buzzed. Radios all over the world announced the positions of the different planes from time to time. As several pilots from foreign countries had entered the flight, their countrymen were watching their progress with as keen an interest as the Americans developed in keeping tab on their own planes and pilots.

All planes were reported except "The Hopelite." Not a word was sent out about it, for no one had seen the plane, it was supposed that the machine had come to grief. In a few hours a searching party was ready and equipped, to start out to search for the machine and the two men.

Some of the faster planes were averaging a hundred and fifty miles per hour. Bets were laid, favorites were picked for the winner.

The searching party warmed up their motor and were preparing to take off to look for "The Hopelite," when a message was flashed from a small town in the interior of China. "Just picked up a small parachute weighted with a heavy wrench Stop Message from airplane 'Hopelite' asking to notify Omaha airport Stop Parachute and message sent by registered mail to mayor of Omaha."

This was perhaps nine hours after the beginning of the flight. The world was staggered. Nine hours from Omaha to the interior of China, other planes were only about fifteen hundred miles on their way.

It was absolutely impossible and yet the mayor of Omaha told the reporters that he had given Paul Plake two messages, one to be dropped in about eight hours and the second one in about sixteen hours. He had given the messages to Plake about two hours before the flight started, so it must have been Plake who dropped the message and yet, how could this be possible?

The relief searching party waited, wondering, speculating, on who was in China trying to perpetrate a hoax on the public.

No one slept who was interested in the flight, for they wanted to find out more about the "Hopelite."

It was perhaps sixteen hours after the start a message flashed from Spain. "Metal plane flew low over town. Stop. 'The Hopelite, U. S. A.' Stop Dropped message with parachute, to the Mayor of Omaha, Nebraska, U. S. A. Stop Now out of sight."

Once more the public were stunned. It was impossible and yet those messages from the mayor. . . . Well at that speed they would soon be back in Omaha, the people waited impatiently for the hours to drag by.

I N approximately twenty-five hours the "Hopelite" came down from the heavens and slid gracefully to a stop in the landing field at Omaha.

As Plake and Goode climbed from the machine they were almost crushed by the eager mob. A reporter pushed his way through the crowd and got the biggest scoop of the year.

"Mr. Plake, please tell me how you can circle the globe in twenty-four hours."

"Well, the earth is always revolving, and at approximately the same speed, roughly one thousand miles per hour. Airplanes or other objects in motion, must overcome the resistance of gravity before they can move, and the speed they attain is governed by the power they have left over after overcoming the pull of gravity.

"Hence to overcome this pull of gravity was my first idea. This is practically accomplished by the metal from which the plane is made. It is light as air yet strong as steel. And the pull of gravity on this metal is practically nil.

"My next problem was to equip a plane for extreme altitudes. My idea was to get just as far from the earth as possible, and in that way reducing the pull of gravity to little or nothing. Of course it is extremely cold up there but we prepared for that.

"At no time during the entire time aloft were we very many miles from where we first entered the air. We merely kept the machine idling along to keep the altitude, and let the earth spin along under us at approximately one hundred and seventy miles per minute. This speed is far greater than man will ever be able to make in any kind of a machine.

"We calculated pretty close to the time when we thought China would be rolling

along under us and we dopped down to give them the message. The same way in Spain. Also here we knew that twenty-four hours would see us back pretty close to Omaha, for the earth had made a complete revolution in that time, so here we are.

"The amount of gas and oil used is not much for while the other flyers are urging their machines at top speed we merely idled along.

"Going north or south of course, the plan is not feasible, but for around the world travel I believe it is all right." Plake smiled a boyish, good natured smile as he linked his arm in that of Mr. Goode and they left the ground for a hotel to get a warm meal and a night's sleep.

THE END

Note on the above story:

To utilize the speed of rotation of the earth we must suppose that the airplane in ascending parted with the velocity of rotation of the earth. No such action obtains in present day aviation.

When a plane ascends it retains the surface velocity of the earth, but, to exactly follow the earth's rotation, it

would have to move faster or slower according to its direction of motion on account of its elevation giving it an increased radius of action referred to the center of the earth. Also to get the 1,000 plus miles per hour, the flight would have to follow the Equator.

IN THE JULY ISSUE—

SPACE WAR

By Neil R. Jones

More exciting adventures of Dr. Jameson with the Zeromes

The Phytic Empire

By DERALD S. WALKER

If we read a treatise on funguses (not using the Latin plural) we are told the most extraordinary story of what they can do. We are told of some that are so poisonous that it is dangerous to sleep in a room with them and of others that are so powerful in their growth that, germinating under a heavy stone, they will lift it up. Many are highly poisonous if eaten and there seems to be no way of distinguishing the poisonous from the edible except by careful trial or by familiarity with the appearance. This story is based on the idea of fungus action.

WE three were close friends in that little Indiana high school. Fate held for us widely diverging careers. Later we were to be drawn together into the vortex of a maelstrom that threatened to wreck civilization. One of us established a cruel despotism over the earth. Another sought to destroy him, not knowing his identity. To me fell the lot of—but I shall explain.

Robert Worth was the most dominating of us. His ambition was to be a great soldier or a captain of industry. He was the acknowledged leader of all the high school affairs. I admired, envied and at times secretly disliked him. I felt that Paul Dwight would go farther and do more. Paul was the best student and showed a keen interest in things mathematical or scientific.

The first break in our friendship occurred over a girl. Bob and Paul were openly rivals but she divided her time impartially between them. I too admired her but made no headway against the two. Suddenly, during the flu epidemic, she died. I resolved to be more aggressive in the future. Bob promptly enlisted though he was only seventeen. I never thought Mary's death had much to do

with it. He had long wanted to go. Paul was affected the most profoundly. I believe he really loved her, for he never seemed the same again. He became more engrossed in his books than ever, dropped his athletics and discouraged all social contact.

Worth never saw active service in the war. Later, he went to West Point, graduated with scant honors and soon left the army. Years later, I learned that he was connected with the Secret Service. Dwight and I went to the same university, but pursued different subjects. He continued to keep to himself and after the first semester I saw little of him. He was a brilliant success in his studies but took no part in other activities. After graduation he continued in Physical Chemistry and I went into Journalism. Later Dwight received a Ph.D. in Botany. I became fascinated by his career and occasionally interviewed him. In order to follow intelligently his many contributions to science I studied books on Chemistry and Biology. A scientific training picked up in this way aided me greatly in my work and was later to be of more direct value.

Genetics was the first branch in which Dwight established a reputation. He produced many mutations or sports by X-



I hadn't long to wonder, for I heard a footfall behind me and a gunshot reverberated like a cannon through the cave. I whirled and fired at the figure in the entrance.

rays, radium, chemicals, and newer means. Such work had been started in the later twenties but the results were chance. By extremely careful technique he added characters to plants and controlled the nature of these changes. In some of his later papers he gave careful directions so that other workers could duplicate his results.

Of even more importance, both to pure science and to economic botany, were his methods of plant propagation. An important method of producing new plants is from seed. A seed is a sexual product, the result of the mixing of the protoplasm of two individuals. A new plant growing from a seed is unlike either parent but shows some of the characters of both. If the parents are alike and pure, the new plants will be uniformly similar to them and to each other. If the parents are widely different or greatly mixed, plants resulting from them will vary greatly. They will often show characters not new but not showing in either parent.

THE method of plant-breeders is to cross differing strains and select desirable progeny. The plants selected are preserved in one of two ways. If they are to be propagated by seed they are selfed. The same plant is both male and female parent. This is applied to grains such as wheat. The other method is by cuttings. This is applied to most fruits. Barring the rare bud sports, cuttings give plants like the parent even though a seedling from such a plant might vary widely from it.

Grafting has long been a most important method of vegetative propagation. In most fruits, some root stock, often a seedling, is selected. A twig or scion from a desirable tree is bound to this in such a way that the two grow together as a single plant. Before Dwight even the most skilled plant propagators could produce a graft only between closely related

species. The difficulty lay in a chemical difference in the sap of the two plants.

Dwight's work with inter-generic grafts was successful almost from the first. He synthesized or extracted important substances present in the scion part but not in the root. An aster was grafted on a mustard plant, an unheard of thing before. As long as the mustard was fed with aster derived compounds, the aster continued to thrive and bloom. When the feeding was discontinued this part died. Another mustard plant was treated in such a way as to make it in some respects aster-like. Such a plant could be successfully grafted with various asters as readily as with other mustards.

It was Dwight's ambition at this time to produce a stock plant on to which any other could be grafted. For this he chose the ginkgo or fan tree. This is called a living fossil because of its similarity to earlier vegetation. He considered this of all plants most similar to the ancestors of other living ones. Using it as a starting point he generalized it further by controlled mutations. After long research he had produced a new plant quite different from the parent ginkgo. He could graft any living form of vegetation on this.

Some of his latest work dealt with plant paracitization. His specialty was higher parasitic plants such as mistletoe and beech drops. The relation between the parasite and host is in the nature of a natural graft. Though the parasite is usually unrelated botanically to the host their relationships are highly specialized. A certain mistletoe can attach itself to only a few oaks. Dwight produced a generalized mistletoe that would grow on many other plants. He did similar work with beech drops, which attach themselves to the roots of the host. His masterpiece was a plant which would graft itself underground on to the roots of any other plant. He could control this parasite so that it would bring about any

changes he desired in the host plant. He reported this in a lengthy monograph which established him as the world's leading scientist.

FOR several months no other papers of his appeared in the journals. He had contributed regularly before and thinking there must be a reason I decided to get the story. I arranged for an interview by telephone and flew to his desert laboratory. Dwight lived and worked in an abandoned ranch house north of Gallup in New Mexico. I flew to Gallup and headed north to the rocky canyon with its lonely house.

Dwight greeted me more cordially than usual and seemed in a happier state of mind. We had dinner and, after he had explained some of his more recent work, we sat down to smoke and talk:

"Man," he spoke with unaccustomed enthusiasm, "my researches are working out splendidly. Soon there will be results to report that I myself never dreamed of; new fruits, larger crops, centuries of breeding skipped over in years. It isn't just myself who is doing it, though."

"You are working with another scientist?" I ventured.

"No, not exactly," he said smiling.

"Have you developed some robot then to help you?"

"Something like that."

"You know, Dwight," I said, "I think you are working too hard. Why don't you take a vacation?"

"You think I might have a nervous breakdown from overwork?"

"Others have."

"I agree with you. I'm going to make a change, mingle with others and play more."

"That's an excellent idea, but when?"

"Just as soon as—well my new monograph is about ready. I want you to be first to see the results of my work. Could

you come here April the twentieth at seven o'clock in the evening?"

"Yes."

"I'll count on you then. That's the time I've given myself to finish it. Come and I'll promise you a story that is a story."

My curiosity was aroused but he wouldn't tell more. For the next few weeks I kept thinking about it. When the day arrived I flew to Gallup and turned north. He said to come at seven o'clock. I was a little early but that shouldn't matter.

Soon I was over the canyon in which the ranch house stood. Something was wrong. I couldn't have mistaken the place but instead of the house was a smouldering heap of ashes. Quickly I selected a level spot and settled the small plane before the hangar. It was locked but I could see Dwight's plane through the window. Going over to the location of the house I could see several misshapen pieces of large apparatus. The ashes were too hot to investigate but I wandered about the vicinity calling. If it were an accident and he had escaped he wouldn't have left the plane. Perhaps he had been murdered by bandits. They might reasonably have left the plane as a blind. Another possibility was that he had been burned to death in an accidental fire, or perhaps killed by an explosion. Was this the surprise he had for me?

I hurried back to Gallup, a city of five thousand on the nearest railroad, to organize a search party. I soon found the sheriff's office and had a talk with him. He thought robbery was perhaps the motive, though he didn't disregard the possibility of an accidental fire. In either case we had little hope of finding Dwight alive. Though Dwight had become quite wealthy, I learned that he never carried money. He flew once a week to town for mail and supplies, always paying his bills by check. Of course bandits might not

have known of this habit or there might have been certain valuable pieces of apparatus which could be turned into cash.

SOON we returned with a party of searchers. Going through the ashes, which had cooled somewhat by now, we found no trace of him. This was not surprising since the hot blaze might have consumed a body entirely. I had hoped at least to find some sort of fireproof box in which valuable data had been kept but was disappointed. We did recover over a thousand dollars' worth of platinum from the ashes, indicating that the fire was accidental. The plane, hangar and other buildings disclosed nothing. Dwight had a safety deposit box at the Gallup bank but this contained only his will, made out a year before, and personal business papers. It seemed that the results of his recent work were lost forever. I returned with the story and continued with my work. Dwight's death stimulated research along the lines he had followed but not all of his results could be duplicated.

It was in the summer of 1948, a little over a year after Dwight's disappearance, that changes in climate and vegetation were first noticed. Certain unusual sunspots were generally blamed for this. I was sent to all parts of the earth to study the disturbances. A mysterious blight affecting vegetation spread over all Asia from Siberia to Ceylon. The crops had appeared unusually good until a few weeks before harvest. Then they withered and gave only a tenth of the normal. This started in India and preceded the harvest northward far into Russia. Mung beans, millet, rice, soy beans and wheat, the leading food plants of these peoples, were most seriously affected. That winter it was estimated that two hundred millions perished in famines and riots.

At the same time harvests in Europe and America were unusually good and

much food was exported. Each government, however, feared this blight visiting their country and stored food against that possibility. Plant pathologists could offer no explanation for it. Though no increase was noticed in the rainfall certain regions in North Africa became overgrown with vegetation. This led to quarrels between Italy, France and England over claims to the previously worthless lands. Italy and France became involved in a war against England. Germany was drawn in through her commercial interests and perhaps in hope of regaining lost territories. The war was quick and decisive. A plague suddenly swept over Italy and France and stopped there. This disease was not contagious and appeared to be due to food-poisoning.

It now appeared that some human mind was directing these strange occurrences. Other plagues broke out in localized areas. All the nations organized powerful detective agencies to solve the mystery. Each suspected others of instigating the plagues. This hidden control of vegetation became popularly known as the Phytic Empire.

Robert Worth became a leading figure in the Secret Service. He followed a lead suggested by an American botanist. This man noted certain peculiar hair-like extensions down from the lowest roots of all the plants he studied. These withered leaving scarcely a trace as soon as they were disturbed. It was believed that farther down these extensions united to form larger roots. They in turn perhaps united to form a few great cables leading to the secret control.

It would require an appreciable time for an impulse from the controlling station to reach a given place. Soon after a potted plant was transferred to the open soil it underwent changes. Sometimes it developed a deeper green.

Again there would be a more upright tilt to the leaves. An experienced worker could tell accurately when the union took place. Seedlings transplanted to a greenhouse bench did not show such signs. By noting accurately the time required at a great many places, the control was indicated to be about a hundred miles north of Gallup in New Mexico.

IF this were Dwight's work he couldn't have gone far, they reasoned. It was generally conceded now that the strange plant changes were the result of his work. Many people thought that he had been murdered and robbed of his discovery. I had an idea for checking up this location and went to Gallup, Robert Worth's headquarters, to discuss it with him. It had been years since we had seen each other. There was much to talk about but I soon explained my plan to him.

"I don't admit reporters, as a rule," he spoke condescendingly, "but for old times sake alone I let you come. I already have too many foolish suggestions to follow up. If it's an interview you want to get, just tell them that I refuse to make a statement. I'm sorry that anything of my work ever got into the papers. The men in control may have spies all over you know."

"Are you sure the control is near here?" I asked.

"I would tell you a lot if it wouldn't be published," he said. "Good afternoon. Drop in for another chat sometime, but I can't promise an interview until things are settled."

I left, feeling I could have helped him had he let me. That he was not particularly trained in science I learned from his reaction to my suggestion. Simple as it was he didn't understand it. He may have had some successes as a detective but they had gone to his head.

A better understanding of the recent advances made in science, especially Dwight's work, would have helped him a great deal now.

I hurried home and started my experiment. I bought several potted geraniums from a florist. Next I prepared a large pan with a layer of agar-agar jelly about an inch thick. This was similar to the jelly used in growing bacteria, but instead of the usual nutrient I added a small amount of alkali and some litmus, making a blue jelly. This I cut into long strips about an inch square in cross-section. I placed these strips on the moist soil of my garden so that they were aligned in various directions. Next I propped up the plants so that the lower surface was in contact with the upper surface of the agar. Within the time calculated for that location small processes started growing up through the jelly toward the geranium. These would have been invisible, but due to their acid secretions they made red streaks in the agar which could be photographed with a suitable plate.

By noting the angle at which the roots entered I determined the control to be south of Chicago. At that time I was sent to investigate rumors of a new plague in India. I had an assignment in Reno, Nevada, on the way and repeated my experiment there. The control appeared to be southeast. I feared Worth was being led by a false clue. Perhaps he was right or I, too, was on the wrong track. In Calcutta, Bombay, and other widely separated points I took readings. According to my findings the control was not near Gallup, but much farther south in western Brazil.

IN spite of Dwight's eccentricities as seen by others I knew he could not be the fiend at the bottom of these

atrocities. I studied the newspaper files of April 1945 hoping to find a clue in them concerning the identity of some criminal who had presumably disappeared at that time. I noticed one item of this nature but thought at first it could have no connection.

A Mrs. Margaret Harmon had left Reno alone in an airplane, after securing her divorce, and was never heard from again. The name sounded familiar. In reading the three follow-up articles I learned that she had been Margaret Lacey, a younger sister of the Mary we three had admired as boys. I remembered her as an awkward little girl. On obtaining a picture of her I noted a close resemblance to Mary. Could Dwight have fallen in love with the sister of his former sweetheart? Then might they have gone to the jungles of South America to be alone, leaving no trace behind them, later to exert a strange tyranny over all the world? I learned that she had corresponded with Dwight. It was significant that the Lacey's were remembered in his will. Might they have planned this all along?

Believing the control to be located in the forests of Brazil, I made plans more or less secretly for an expedition there, hoping to destroy it. Whether it was in the hands of strangers or my former friend there would be considerable danger. I disclosed my plan to Worth, but he gave little encouragement.

While preparing for this trip I received a strange letter. This message made it imperative that I hurry but emphasized the necessity for secrecy. It was a letter found in a bottle, written by Dwight, addressed to me, and picked up by a steamer in the Atlantic.

"ON the night of April 20, 1945," he wrote, "Margaret came to me. We had met secretly before and planned

it all. My monograph was ready for the publishers and we were to be married in Los Angeles and take a trip.

"There was a knock at the door. I opened, four strange men walked in and before we realized what had happened we were prisoners. The leader's aim, judging from his actions, is to depopulate the earth. I only know that I am forced to carry out his demands. There are only four and if you could come here secretly, bringing guns, we might overpower them and escape.

"We are in the Andean foothills in Western Brazil between the Yavari and Jurua rivers about forty miles from the Peruvian frontier. Find the large left branch of the Jurua River. A hundred and ninety miles west up-stream you will find a much smaller branch to the right. Fly northeast from here. Sixty miles away is a dome-shaped hill with three large trees on top. On the north side is a rocky cliff. In this is the cave.

"Don't fly around too much to arouse suspicion. Settle the airplane down in the jungle about a mile to the north and walk to the cave. If you see a man shoot to kill. The cave is large and the hangar is about a hundred feet back. Beyond this nearly a mile is the laboratory and our home and prison. Take the right cavern, not the left. If you are careful there are many places to hide in the cave, but be watchful for traps, especially plant traps. I can't warn you specifically as they change them often. We are leaving to establish a new false center in the Southern Sahara and I hope to be able to drop some of these bottles in the Atlantic.

"Please don't send a big expedition as then we may not be able to escape. Come alone and hurry."

AFTER reading the letter I made a copy of it and mailed it to my

editor at his hotel in San Francisco. He was in the next office but it would take three days to go there and return. I expected to be back in three days. If I wasn't, a follow-up party might be welcome.

"Can you spare me for two or three days?" I asked him. "I just got a red hot tip for a story?"

"Concerning the Phytic Empire?" he asked.

"Yes."

"Well hurry back," he said, "and be sure it's something this time."

My plane was in excellent condition. The fuel tank was good for a four-thousand-mile trip. Maps and emergency rations were in place. I had almost forgotten guns. I carried one in the plane but didn't know where I could get several on a minute's notice. I thought of my friend, Lieutenant Hickman, of the U. S. Army in the Canal Zone. I had better stop there for safety anyway to refuel. Within twenty minutes after receiving the letter I was off. I settled the plane down to three hundred miles an hour, about the maximum safe speed for any great length of time, and began studying maps. I should reach Panama shortly after midnight. I called Hickman, explaining when I would be in, and that I would need a supply of fuel, three light army pistols, some ammunition, a strong knife, and perhaps a hot lunch. He promised to be waiting for me with them.

The plane was running smoothly. It would be seven hours before I should need to get my bearings. I would need plenty of rest, and had gotten but little the night before, so I relaxed and after setting the alarm went to sleep. When I awoke it was dark but I presumed I was over the Caribbean. Soon I was reassured by the short-line of Panama and, later, by the lights of Colon. I landed and found Hickman waiting

with the supplies. In ten minutes I was off again, this time in a southeasterly direction. I hoped to reach the Amazon about two hundred miles west of Manaus then turn west and a little south to the Jurua. Being anxious to get there before daybreak I let the motor do about four hundred miles per hour. It wasn't safe to force it that way but I must take some chances.

For about an hour I was over the Colombian Andes. These gave way, beyond Bogota, to a grassy plain. After a smaller mountain range, I saw below me only tree tops. I flew hundreds of miles over dense jungles without a sign of human life. Fortunately there was a full moon and the night was moderately clear. Through monotonous hours of this I crossed several smaller rivers, and a narrow lake which fooled me at first. Finally I came to a broad mirror with tree-lined edges which I took for the Amazon and turned west. I was in sight of this river for only a short time and was soon sailing over an ocean of trees hoping to find the Jurua somewhere in the selvas.

AFTER a long time I came upon another large river, smaller than the first. It was misty now and I had to fly low to keep in sight of it. I feared missing the large branch to the left and slowed down to a hundred miles per hour. I noted the left branch easily and read my distance. At a hundred and ninety miles I might have to look very carefully for the much smaller right branch. It was a faint line without a name on my map. In two hours I had found it, after going back twice. I had expected a small stream completely overhung by trees, but this was really quite large, otherwise I would never have found it in the mist. I was now only sixty miles from the cave. The land rose here and became rougher.

Fortunately there was less fog. I rose quite high and could still see the landscape through the telescope.

Very soon I recognized the hill with the three trees. I was nearly over it and could make out a rocky cliff on the north side. I started my landing apparatus, muffling it as much as possible, and settled down as Dwight had suggested at the edge of the jungle. There was a cracking of twigs and a tearing of vines as the weight of the plane came upon them. Suddenly it became terribly dark. Only a few stars directly above were visible. The machine had tipped slightly and piercing the darkness with my pocket torch I could see the ground fully twenty feet below. Taking the four pistols, knife, torch and compass and grasping a strong looking vine I lowered myself to the spongy earth, directly below the plane. Taking my bearings from the compass I started in the direction of the cliff.

I proceeded very slowly, cutting vines and creepers at every step. It had been very quiet after the motor stopped but the murky forest was now a bedlam of noise of every description, mostly from insects. I hadn't landed far in the jungle for soon it was appreciably thinner and I could take several steps without cutting. Once I stumbled into a giant spider web and the strands held like cords. I shuddered when my beam fell on the gaily colored occupant fully three inches long. It was getting a little lighter or my eyes were more accustomed to the darkness. I made haste but used the torch little lest the light be seen.

Suddenly something stung my left hand. It was like a thousand red hot needles. At first I thought of a scorpion, but it held my hand between firm jaws and I was unable to pull out of its grasp or drag it along. While the pain and unknown dread nearly drove

me wild I felt around with my right hand. I fingered and could now see the outline of a spiny reptile-like neck. With the knife I severed it and cut the ugly jaws from my hand.

Daylight had broken and I could see the thing very much alive in spite of its loss. It was a plant, a giant sundew many times larger than any I had ever seen before.* Evidently it was a monstrosity developed for catching birds as one lay struggling in another of the traps. I killed the feathered prisoner to end his suffering and bandaged my bleeding hand, thankful that it was not the right one. Dwight had warned me against traps. This one was meant for birds. Perhaps the cave held similar ones for men.

The cliff rose above me scarcely a hundred yards away. The cave yawned at the base but I could see no sign of men. I advanced, keeping behind bushes and rocks as much as possible and entered. There was at first no sign of a hangar but as my eyes became reaccustomed to darkness, I noted an unusually luxuriant growth of vines on the sides. This probably camouflaged the hangar and undoubtedly some traps. I didn't investigate but went on cautiously. I wondered when the men slept and if any were about now.

I HADN'T long to wonder for I heard a footfall behind me and a gunshot reverberated like a cannon through the cave. I whirled and fired at the figure in the entrance. The man dropped in his steps with a bullet through his heart. Another man ran up with drawn gun. From the cave I fired again and this man too died instantly. I shuddered at what I had done, but reminded myself that this was war, a war with civilization threatened and until now unable to strike back. We couldn't afford to give

* A plant of the genus *Drosera*.

them a chance. With the strain we were under any man would have done likewise had he the opportunity.

I dragged the bodies into the cave and changed clothes with the one nearest my size. After waiting a little longer to make sure that no one else was coming I started back. At first I crept along, carefully feeling for traps and pitfalls. After a time it seemed to get lighter and soon I could walk along rapidly. The source of the light puzzled me. It was unlike daylight and yet more unlike any artificial light I had ever seen. It was a ghastly light resembling phosphorescence or the fox-fire* of certain fungi or wood in decay.

After several turns I came to a fork. The left cavern was well lighted and smooth. The right and smaller one was in semi-darkness and strewn with boulders. Another trap I thought, and took the left as Dwight had directed. Through many more turns and downward passages the cave gradually became larger and more brightly illuminated. I went more cautiously now to avoid traps and also to avoid being seen though I hoped to be mistaken for the man I had killed.

I had difficulty in realizing that I was not in the open. As I advanced I found a soft turf growing beneath my feet. The high walls of the cavern were covered with every sort of blooming vine. At intervals shrubs and trees rose from the barren rock. Some were in bloom with the most exquisite flowers I had ever seen; others bore huge clusters of strange and tempting fruits. I realized my hunger and inadvertently picked a large plum-like fruit.

Taking a bite it seemed the most delicious morsel I had ever tasted. It was neither sweet nor tart but melted in my mouth like honey. Even as I

swallowed it a strange restful drowsiness came over me. I felt impelled to eat more and lie on the soft grass oblivious to everything. It was an almost overpowering desire but when I realized how much was dependent on my work, I tried to think and keep my faculties. It was hardly likely that men passing this fruit would not succumb to its charms at least once. Surely there was something at hand to counteract the poison.

There was another fruit near by. This was green and looked inedible. I hastily took a bite of one. It was extremely bitter and made me want the pretty fruit more. At least it wasn't an enticing trap so I swallowed some of it. It made me deathly sick but roused me so that I knew it to be the proper antidote. The bitter fruit had made me terribly thirsty, but I feared to partake of my treacherous hosts' refreshment. I walked on in the open now feeling that my disguise would protect me. Perhaps I was slightly intoxicated by what I had eaten.

The scenery changed gradually. There were gnarled trees in gruesome shapes. Vines hung fantastically from the cavern roof. The delicate aroma of the flowers gave way to a pleasing but pungent and musky smell. Things seemed to be on a grander, coarser scale more in keeping with such men as would rule the place.

I saw a massive door in the rock wall. It was a strange door, apparently well built, yet on closer inspection it appeared to have grown like a fungus. Taking a gun in my hand I boldly reached forward to the handle of the gruesome door. That at least appeared to be made of solid iron. The handle moved like a slime mold* but faster

* Phosphorescent light produced by decaying vegetation, it is of low intensity.

* This is a class of organisms, which at one time was regarded as animal, but now are considered to belong to the plant-world. The botanical name is *Myxomycetes*, (Greek. Slime fungus.) The name *Mycetozoa*, (Greek, fungus animal) was formerly assigned to it.

and literally flowed around my hand in a sticky wax. I quickly jerked away, leaving the bandage on the handle. It was fortunate I had injured my hand.

I WONDERED if my act had set off an alarm. Perhaps I was already seen. I dared not try to hide, fearing another trap. Should I look elsewhere? That thing certainly looked like a door. I poked it with a pistol. Nothing happened. Looking carefully I saw what appeared to be a nail on the side opposite the false handle. Being leery of iron I pressed this with a pebble. The door swung silently open and I quickly stepped in as it swung back. With a pistol in each hand I surveyed the room. It was fitted as a living room, luxurious but obviously a man's room. No one was in evidence.

At the farther end was a door standing ajar. I passed through this, and found it also unoccupied. Here were rows of tables laid out as maps of different portions of the earth. These were dotted with fungus-like cups. Along the wall were numerous bottles each containing a liquid and with a dropping pipette in place of a stopper. These bottles had various suggestive labels, such as: blight, plague, rice poison, stimulated growth, cyanide, milk poison, and many others.

I heard a shriek as of great agony. It was unhuman but filled me with horror and pity. I tried the door and finding it unlocked, slowly pushed it open. A man was engrossed in his fiendish play and did not notice me. A small monkey was tied to a table and a cruel smile spread over this madman's face as he burned it with a hot wire. With two shots I despatched man and monkey.

Three of the terrible gang were gone. I still had the fourth to cope with. He might be attracted by the shot. No

other man could be hiding in the room and there were only two doors. While watching the other door I pushed a chair back against the knob of the one I had entered. With a drawn pistol I tried the other. It was locked. Searching the dead man I found a bunch of keys and opened it. There Dwight and Margaret waited in a well-equipped laboratory. They had heard the shots and hope shone in their faces.

"You've come," he spoke with feeling. "I feared my letters would not be found until too late. That animal torture was just the forerunner of wholesale destruction somewhere. Did you get the men?"

"Three of them," I answered.

"Where did you kill the other two?" he asked, showing great concern.

"At the entrance."

"I hope it isn't too late. We must hurry," he said grimly and rushed to the control room and began expertly to dismantle the tables.

"That man may poison the air in the cave," explained Margaret, "we would be safe in here but we must get out if we can."

"In any case their power is broken. You've killed the leader here and none of the others could re-establish connections," Dwight told us as he stepped to the door and, causing it to swing open, sniffed the air cautiously.

"It's good so far," he announced. "Shall we make a run for it?"

"I'm willing," said Margaret eagerly.

Everything was as I had left it and I couldn't realize the need for haste. When we had passed beyond the plants and were in the darker rocky part of the cave we were very tired and slowed down. I suggested resting, but they said we must press on.

DWIGHT was first to notice it, then Margaret and I could too. It was

a faint odor of bitter almonds, hydrocyanic acid.* There was but a trace as yet, only enough to give a headache, but Dwight assured me as we hurried on that the plants farther back in the cavern were giving off great quantities of that most deadly poison.

"How will we get the man guarding the entrance?" I asked.

"That's our big problem," said Dwight. "He's waiting to shoot you if you come out. I think we could get their plane out, but not without exposing ourselves. I'll let him take me prisoner and say you and Margaret are in the cave. It's the only way but not very good. We must all leave within the hour."

We were in the dark part now but could see daylight. It would have looked pretty good had we not known what might await us there. When we had gone as far into the daylight as we dared we heard an airplane motor. I looked in time to see my own plane rising above the tree tops.

"We have to get him," shouted Dwight as he began tearing at the vines on the side of the cave. They became loosened from the wall and fell exposing a large room where the plane stood. We hurried in. The motor was started. In less than a minute we had turned out of the cave mouth and were in the air.

"There he is," shouted Margaret looking through a telescope.

Taking the glass I could see him too. Fortunately he was headed north. We were getting home.

"Is this machine equipped with radio telephone?" I asked Dwight.

"No," he laughed. "We weren't on speaking terms with the rest of the world."

"Then we must get that plane, and quick," I shouted.

* This is a haloid acid, HCy, or HCN; it may be written either way. It has a very characteristic odor, not at all unpleasant, resembling that of oil of bitter almonds.

"I'm giving her all of it, but why the hurry?"

"Man," I yelled, "this is the greatest scoop of all time. I want an extra on the streets in an hour."

WE were overtaking him rapidly though the little plane was now doing nearly five hundred.

"He's shooting at us with a long-range rifle," announced Margaret. "If he fires the gas tank we will have to take to the chutes. He's crawled out over the fuselage to get a view of us."

"I used to be a pretty good shot in the mountains," said Dwight, taking down one of the plane's guns.

Both men exchanged several shots. One of the wings was nicked but our adversary made no other hits. On Dwight's fifth shot the man plunged to the rocks below. The little plane continued steadily northward. Soon we hauled up directly above it. I tied a rope around a brace in the cabin and the other end about my waist.

"I guess we'll take that delayed trip to Los Angeles," said Dwight.

"Wish you happiness, but I must start that extra."

I lowered myself through the cabin window and Dwight maneuvered so that I could board my own machine. I untied the rope and throttled down the motor.

"Panama, Panama," I shouted, adjusting the instrument.

"Panama on the air," spoke a voice.

"Give me Chicago."

Soon I was dictating the story. The presses started to hum and long before I had finished, the first extras were on the streets.

The Phytic Empire is now the property of the United States War Department. It will never be used in war for its power is well known.

THE END

In the Realm of Books

Conducted by C. A. BRANDT

THE SEALED CAVE. By Louis Herrmann. Published by D. Appleton-Century Company, 35 West 32nd Street, New York. 226 pages. \$2.00.

Dr. Herrmann is a newcomer in the field of science fiction. He was born in England, and finished his studies at the University of Capetown, South Africa. He specialized in social biology, in which field he did some important research work, and he is now head master of Capetown High School.

"The Sealed Cave" is supposed to be a strange discovery made by Captain Lemuel Gulliver in the year 1721 and now published from manuscripts and notes recently discovered in South Africa.

We all remember "Gulliver's Travels" as described by Jonathan Swift. As Mr. Herrmann has it, Gulliver arrived too late from his last trip to add his latest adventures to the well known English satire. Gulliver's notes were lost, but finally rediscovered by Dr. Herrmann, and produced as a book. Captain Gulliver on the good ship *Porpoise* is adventure-hunting in the Mediterranean. A tidal wave throws the vessel upon a tiny Aegean island. Gulliver discovers a cave recently opened by the earthquake. After a hazardous climb down a steep declivity he discovers a vast system of caverns, which much to his surprise are inhabited by a tribe of sub-humans, uncouth, apish and beastlike in appearance, but good natured. He is kindly received, and after living with them for a few weeks he believes that they are the remnant of a prehistoric tribe known to science as the Moustierians. Their ancestors had escaped destruction from the ever advancing ice shield of the glacial period by seeking shelter in the then open caverns. An earthquake had sealed the exit, and for countless centuries the tribe had managed to exist. They developed a sort of communistic civilization of a very low type, also a trace of religious ritual, but did not advance artistically or mechanically. They went perfectly nude, but covered themselves at night with fur robes made from the skins of bats. Grunting and clicking sounds served as a language, which Gulliver was unable to learn, but a young female, whom he taught a small amount of English, served as his interpreter and guide. They were perfectly happy and satisfied with their subterranean existence, and were violently opposed to any and all changes. They always had enough to eat, bats and cultivated fungi furnished the food, lichens and bat-fat the fuel, and ample deposits of clay, the material for their crude pots and vessels. Every-

body had certain tasks to perform and all shared equally in everything. But as there is an end to all things, there came an end to the poor Troglodytes. "Coryza" (the common cold to you) finished them. The cold germs, brought into the cave by Gulliver, created an epidemic, against which they could not develop any resistance, and the poor things died like the proverbial flies. His faithful guide is dying too, but, with her last strength, she shows him the way into the forbidden passage, through which he escapes into the upper world, and is taken off the island by a passing vessel.

The book contains a great many biological, anthropological and ethnographical speculations, which are extremely interesting.

Fortunately, unlike Dean Swift's narratives of Gulliver's other travels, the element of satire is totally missing in the "Sealed Cave," and it can be read and enjoyed as a simple yet interesting fantastic tale.

THIRTEEN SECONDS THAT ROCKED THE WORLD. By John J. Meyer. Published by Rae D. Henkle, 100 Fifth Avenue, New York. 205 pages. \$1.75.

A science congress had been called in New York. Seven of the scientists meet at night at the home of Professor Olney, to discuss ways and means of saving civilization from the continuous depression. They reveal to one another the discoveries they have made, and which they did not disclose during the sessions of the congress and formulate plans to establish a sort of technical-scientific government (Technocracy once more). They unite the brain-power of 1700 million people (how that is done is not revealed) into one controlling super-brain-machine, the so-called Mentator, which from then on, guides the destinies of mankind.

The above is the idea underlying this book, and believe me, it took some scratching and digging to separate the ideas from a well-nigh hopeless jumble of meaningless words. Mr. Meyer deserves credit for the idea of the book, but he did not do it justice. The big idea is so poorly handled, that the text at times is almost silly. Most of the time the book is dull. In the hands of a master craftsman the book could have been good.

OPEN THE DOOR. By Wilfred Brandon. Transcribed by Edith Ellis. Published by Alfred A. Knopf, 730 Fifth Avenue, New York. 195 pages. \$2.00.

Every once in a while, a book appears in which the author explains in ample detail,

what becomes of the "soul" after death has occurred.

The most readable and the most plausible one of such books was and still is the old classic: "The Certainty of Future Life on Mars" written by Gratacap, and published by Brentano about fifteen years ago.

The great fault shared by all books of this type is that their authors apparently know next to nothing about biology, chemistry and other concrete sciences, nor do they know anything about empiric philosophers. They surely never have read Haeckel's "Riddles of the Universe."

In "Open the Door," one Edith Ellis attempts to convince the reader that the "souls" assemble after death somewhere in the fourth dimension, where they continue to live, in exactly the same manner, as the bodies, they formerly inhabited, did on earth. From this fourth dimensional dwelling place they may return to earth and again occupy a body, if they choose to do so. Vivid descriptions are given in the book of this glorious astral existence, and though I do not share the beliefs of the authors, nor believe the theories expressed in the book, I respect its sincerity and admire its earnestness.

Chacun à son gout.

THE CONQUEST OF THE MAYA. By J. Leslie Mitchell. Published by E. P. Dutton & Co., 286-302 Fourth Avenue, New York. 279 pages. \$3.75.

Ever since Father Donnelly wrote "Atlantis," the interest in the riddles of the Maya, Aztec and Inca civilizations and cultures, as well as their respective evolutions and origins, has been

kept alive. As Donnelly pointed out, there must have been early points of contact between Greek and Egyptian civilizations and the so-called New World, shown by the similarity and identical meaning of Greek and Maya words, the much discussed elephant heads which appear with great frequency in Mayan temple decorations, etc., etc. In the meantime a new school of anthropology has grown up, which has established with fair certainty that all Central and South American cultures had their origin in Egypt. This new school also claims that there had been commercial and cultural contacts with Asia, but for this no absolute proof has as yet been established. Peculiar, however, is the fact that neither contact brought the wheel to the Americas.

Mr. Mitchell's book, profusely and well illustrated contains a wealth of information, mostly new, also an explanation of the three Maya calendars, which must have been quite confusing even to mathematicians. Quite a number of chapters are devoted to descriptions of the Maya civilization, such as it was. Really beautiful and even poetical are the chapters "Morning and Evening," in the fifth part of the book, in which the author gives us an intimate view of the daily life in a Mayan city.

Apparently the invading Spaniards did a very excellent job, by slaughtering as many of them as they could catch. Unfortunately, the Spaniards also destroyed almost all the available records, in their hatred and disgust, but this is pardonable in view of the swinish cruelties of the Mayan priests. I am afraid, that the Maya riddle will remain unsolved until a new Rosetta Stone is discovered.

WASTE OF HEAT

Man lives by heat. It is essential that he exists within a definite range of temperature. Anything over 100° F. is found trying by dwellers in the temperate zone, and in the polar regions the cold is very trying and has to be combatted by heavy or non-conducting clothing. Yet the sun by which we have our very being, pours out heat at a tremendous rate and our little globe absorbs a very little, and its "clothing," as we may term it, of air, retains heat in one of its actions and protects us from

too severe changes in temperature in another action. We read of some of the natives of the tropics dressing warmly to keep out the heat and we wear overcoats in winter to keep it in. It is a good deal like the man in Aesop's fable who blew hot and cold—warming his hands by blowing through them and using the same action to cool his soup. In the next issue of AMAZING STORIES this feature of the sun and its action on earth and the effect of our jacket of air will be treated at length.

DISCUSSIONS

In this department we shall discuss every month topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

A Letter from a Canadian Reader Who Approves of AMAZING STORIES

Editor, AMAZING STORIES:

Have just finished reading your March '35 edition of our mag and I must say that it leaves nothing to be desired and that it lives up to the title "The Aristocrat of Science Fiction." This issue seemed to be, in my estimation, one of the best and I am quite qualified to make such a statement from the fact that I have read every issue of A. S. since the beginning.

The Cover—Very good, although I thought I could recognize some very modern earthly-appearing buildings among those of the Saturnian sky-city of Irru. More certainly is more than improving; this cover is one of his best.

Editorial—very interesting. At least, Ed., you admit the possibility of space-travel and the difficulties of such are well stated.

Stories:—

"Earth Rehabilitators—Consolidated," by H. J. Kostkos certainly starts out well. Let us hope it continues as good. A very excellent story. "Interference" by Max C. Sheridan is good. Is he a new author, I can't think of any others written by him?

"Conquest of the Planets" by Campbell carries on the Campbell tradition for good stories to the very end.

"Millions for Defense" by Miles J. Breuer was only fair. A good enough story, interesting and all that nevertheless, but not like his "Paradise and Iron" of Quarterly, 1930 fame. He is a very fine writer as other readers of long standing will recall.

"Zora of the Zoromes" by Neil R. Jones was a magnificent story. Any of Jones's Professor Jameson stories are very interesting.

"The Body Pirate" by Ed. E. Repp was very good. It is a long time since I saw a story by Mr. Repp in A. S. Let's have more of him.

By the way, Ed., what has become of the following:

Captain S. P. Meek—We haven't had a story by him for ages. His "Awlo of Ulm" and "Troyana" were excellent stories, not to mention his "Drums of Tapajos."

L. A. Eshbach, who wrote "The Light From the Infinity." I see that you have a story on hand by him, to be published soon.

Fletcher Pratt, another good writer who usually writes in collaboration with someone else. I see you are going to publish a story

by him called "The Emperor of the Sahara." Make it quick.

Aladra Septama, writer of "Princess of Arelli," "Tani of Ekkis," "The Terrors of Arelli," "Beast-Men of Ceres"—all good stories. Where is he?

John Taine, author of "Seeds of Life," Fall Quarterly '31; "White Lily," "A Voice Across the Years," Winter Quar. '31. A good writer, we have not had a story from him for a good many years. How about one?

Jack Williamson, writer of "The Green Girl," "The Stone From the Green Star," Oct. and Nov., '31; "The Lady of Light," Sept., '32.

Charles R. Tanner—"Turnithak of the Corridors," "Turnithak in Shawn," June, '33.

Ray Cummings—"Explorers into the Infinity," "The Man on the Meteor," "Fire People." If you can't get a new one by this author, why not publish a reprint.

Otis Adelbert Kline, author of "The Man From the Moon," Oct., '30.

Cyril G. Wates—"A Modern Prometheus," Fall Quart., '30; "Gold Dust and Star Dust," Sept., '29; "The Face of Isis." A very interesting writer.

Charles Cloakey—"Swordsman of Sarvon," 1932, etc.

Murray Leinster—"Runaway Skyscraper," "The Mad Planet."

Winsor—"Station X."

Russell Hays—"The Purple Plague."

Balmer and McHarg—"The Man Higher Up," "The Hammering Man," "The Eleventh Hour." Very fine writers, good style.

Francis Flagg—"Cities of Ardathia," 1932.

William Kober, writer of "The Man Who Lived Twice," 1932.

Abraham Merritt—"The Face in the Abyss," "The Moon Pool," "The Ship of Ishtar." All very good stories.

Who was the person who wrote under the pseud. of "Marius?" He wrote "The Sixth Glacier" in Jan.-Feb., '29 issues.

I am sorry to see that you have been neglecting your Quarterlies. They were good reading. Can't you get out a few more reprint quarterlies like Winter '33 and Fall '34. Even though I have read all the stories I am one who would support the printing of reprints. It's like meeting old friends.

Lastly. Why don't you print the titles of some of the stories the author has written? Like you did in the old issues of A. S. But

I suppose you haven't enough room on the small pages.

C. Howes,
397 Davisville Avenue,
Toronto 12, Ontario,
Canada.

(It is not always realized by our readers that a monthly magazine gives only about sixty stories in a year, and that means using only five authors' work for each issue. This explains why so little comes from many of our authors. There is only a half dozen stories in an issue and you name some thirty "favorite authors." We shall consider your suggestion of printing the names of stories written and published by some well-known writers whose stories appear on our pages.—EDITOR.)

Campbell and Others

Editor, AMAZING STORIES:

That Campbell certainly is *the* master. Omigosh! There are so many Campbells pecking their heads into Scientifiction magazines that one has to state definitely which one one means. The one I mean wrote INVADERS FROM THE INFINITE, ISLANDS OF SPACE, THE DARK STAR PASSES, PIRACY PREFERRED, SOLARITE, etc., etc. Now you surely know whom I mean. There can only be one Campbell.

I experienced great delight in seeing Neil R. Jones back again with our dear metal friend, 21MM392. Rush his next story, SPACE WAR, I believe, into the May number.

MILLIONS FOR DEFENSE was O. K., but the other two stories did not click. I am surprised at Repp. It certainly has been a long time since I have seen one all around good issue. However, a little praise is coming your way, for I have noticed an improvement.

Finally, Morey should be patted on the back for the March Cover, an astounding improvement over previous drawings.

Keep plugging ahead.

Raymond Peel Mariella,
5873 Woodcrest Ave.,
Philadelphia, Pa.

(We hope to keep "plugging along" and also "ahead." Our authors seem to meet your approval for the most part. Another correspondent compliments Ed. E. Repp for the story you seem not to care for. Tastes differ.—EDITOR.)

AMAZING STORIES Back Numbers Containing
Skylark Stories

Editor, AMAZING STORIES:

I wish to acquaint readers with the fact that I have issues of the magazine containing "The Skylark of Space" and "Skylark Three" which are in excellent condition. These I will sell for \$2.00 a story postage paid. Each story is made up of three installments.

As for "our" magazine, I am gratified to see it bravely weathering the depression as it

is doing. To my mind it outstrips the rest of the science fiction magazines by a good deal.

Martin Lebowitz,
300 Central Park West
New York, N. Y.

AMAZING STORIES in Australia

Editor, AMAZING STORIES:

I have been reading AMAZING STORIES for a considerable time, and I do not think that there has been a single issue that I have not enjoyed immensely.

Unfortunately, "A. S." is rather difficult to obtain here, but it is possible to obtain many old back numbers in second-hand stores at reasonable charges (new, the price is about 3/-).

I have just finished "The Lost City", and though this comment will arrive rather late, I think that this story is one of the best that you have ever published. Why not have the author write a sequel, in which Sir John succeeds in getting back to Atlantis, and establishes communication with Cheops and the rest of the population? I think it would be very popular.

And now I come to a very much discussed subject—that of reprints. Well, I think that a few of the good stories of other years are by no means out of place, but those by E. A. Poe really have no appeal to the modern Sf. readers. They are too oldfashioned, and have not sufficient science in them to be classed as Science-fiction (for example, "Ms. Found in a Bottle.")

"Life Everlasting" was good, but the end-up was not as snappy as I expected it would be. However, it made very entertaining reading, and was well written.

The Discussions Columns are very good, and it is great to read the opinions of other readers of this wonderful Mag. I think that the Editor receives a great deal of unnecessary criticism, because he is only human, and is certainly doing his best (which I think is very good).

The Editorials by T. O'Connor Sloane, Ph.D. are wonderful, and they alone are worth the price of the Mag. However, don't take me at my word, and leave out the stories in the next issue, or you will have one less reader in this State.

The cover designs are very good, but I think that somehow I preferred the large size, with the name receding from the "A" of Amazing.

The inside illustrations are excellent, and so is the idea of running two serials per issue. It makes one look forward to the next copy, and when it arrives, it is more welcome (if possible!) than it would be otherwise.

However, it seems as if this letter is getting a bit long, so I will close with best wishes to AMAZING STORIES, and may their life be a long and happy one, full of prosperity and new sub-

scriptions, which, after all, are what you want.
Yours 'till my next trip to Mars,

John F. Pilbeam

13 Yarra Street South Yarra, S. E. I.
Melbourne, Victoria, Australia

(Such criticisms as yours are, or should be, valuable guides to our authors. It is a long time since we published an Edgar A. Poe story. When we last published one it was appropriate to the Poe celebration of 1934. The good word you write anent the editorials is most acceptable, but you will still have stories and Discussions. On the subject of serials there is so much difference of opinion that it is hard to know what course to take. We expect to have two serials in an early issue and shall await the readers' reactions with interest. Thanks for your good wishes.—EDITOR.)

Unusual Stories Magazine

Editor, AMAZING STORIES:

Not long ago I heard something about a science fiction magazine that came out in 1932 or 1933 and which lasted only one issue. It was called UNUSUAL STORIES, and it seems that it contained stories by some of AMAZING STORIES favorite authors—A. Merritt, Richard Tooker, Cyril G. Wates, H. P. Lovecraft. I hope that fans can tell me more about this unique publication, and where I may obtain a copy.

I am glad to see John W. Campbell back with his new serial. I didn't think P. Schuyler Miller's story in the Oct. issue was up to his standard. It was not nearly so good as "The Titan," which I believe is the best thing he has ever written, and that's saying a lot. And by the way, I have lost my backnumbers containing it and would like to replace them.

George M. B. Hawley, II,
Kappa Sigma House
Lexington, Va.

(We know nothing of the magazine you speak of. There are a number of dealers who carry back numbers of periodicals. You might write to one or more of the authors you name for information.—EDITOR.)

An Amusing Letter from California

Editor, AMAZING STORIES:

Ye Ed:—Credit P. S. Miller with penning a neat bit of entertainment in "The Pool of Life."

Joseph Wm. Skidmore slings a fine potpourri of Mexican, and Grecian, mythology. A nice little fairy tale. The Prince . . . slaying the dragon . . . marries the Princess.

Dave Keller, blast his hide, never fails to entertain. "Isle of White Mice" was a real humdinger. A "real" story. An "entertaining" story.

Let's have less serials, if they don't hang together any better than the latest ones.

Here's to your continued success, and to all stf. mag's success. Why be little? I like them all.

Tom Olog

San Bernardino, Calif.

(AMAZING STORIES feels that it has an excellent "staff" of authors, (if they will excuse the expression.) The personal and epistolary contact with our authors has done much to make our path a very pleasant one to tread. Serials are coming and very good ones.—EDITOR.)

A Letter from a Canadian Reader With Definite Suggestions

Editor, AMAZING STORIES:

I have just started again to read your magazine. I read some quarterlies some years ago, but now after much searching for good fiction I am sold on AMAZING STORIES.

Although I am a new reader, I am taking the liberty of expressing my opinion of your magazine and at the expense of style, I will put my opinions in chronological order.

(1) Both the monthly and quarterly are very good, and provide many pleasant hours of reading.

(2) I preferred the large size.

(3) I prefer interplanetary stories.

(4) I like long complete stories, or if serials I would prefer one serial finished in two issues even at the expense of short stories.

(5) I am all for reprints but not of Jules Verne, his works are too long winded and old—though excellent.

(6) I would suggest a quarterly of one new story and one, two or three reprints according to their length, complete reprint in one issue, however, as three months is a long time between drinks, so to speak.

(7) (a) I would suggest taking your reprint from say five years ago. In five years people forget fiction and there would be many new readers. Thus keep on progressing reprinting in five years time the best stories of the current year, and this year the best of 1929.

(b) If your magazine has been going ten years have in each quarterly reprints of both ten and five years ago. Thus keeping a space of at least five years between reprints and the current stories.

(8) May I suggest that you ask that one of your best writers write a series of complete stories being the history of Moon, Mars, Venus or some other planet. A history somewhat on the style of "The Birth of A New Republic." A series such as the late Robert W. Chambers wrote of American History. A series beginning with the departure of a space ship from earth and disclosing combats with the natives and the wild animals, the founding of colonies; the wars with other planets. As colonists of the earth, the revolution from the earth, foreign wars, civil wars and expansion into greater and

greater power. In brief a new history of America modernized and set in a new planet. I am sure there are many historians among your readers. I am fond of history for one.

Then again, if you were to trace in the story the lives of say an American, a Canadian and a Britisher, complementing the three nations that read your magazine, you would please those who like biography. Either hurry the events one after the other so the heroes could take part right through the stories or, give them very long life or follow the deeds of their descendants, but in any case have a Science Fiction History and Biography rolled into one.

Well I guess this is enough for one letter. I assure you I will never write to knock your magazine, or criticize its staff. Editing is no joke, no not even a small school mag, as I know to my cost.

I have endeavored merely to express in this letter my own personal requests, both for your benefit and the discussion, amusing or otherwise, of your readers. If I have suggested anything of use I will be well pleased, and will more fully develop any of my "Eight Points" if you wish further information. Above all I ask you to believe that I am not writing merely to see my name in print, for to do so, in your magazine would be to sail under false colors as I know very little, in fact no science.

Harold C. Clint
137 Carter Avenue

Quebec City
Province of Quebec, Canada

(This letter speaks for itself in its detail. Much that we have given in our pages carries out a good deal of what you suggest. Sometimes we are afraid that we are giving too many stories of one or the other type, but this is sometimes hard to avoid in editing. The selection to give variety is what we strive for.—EDITOR.)

An Interesting Letter from an Author Who Seems to Anticipate Criticism on His Story Editor, AMAZING STORIES:

Absolute movelessness.

"There ain't no sech animal!" That's what Einstein would have said had he been a farmer. In substance, it will be what science fiction fans will be declaring. They would iterate the identical contumelious ejaculation if one broached the subject of an object moving at the speed of light.

Where was that guy Haggard when he wrote "Relativity to the Rescue?"

Yes, I might as well anticipate controversial brick-bats and hay-makers. It's just another method of coming to a point, speaking straight from the shoulder and right from the heart.

In our little tête-à-tête Professor A. S. Eddington, M. A., LL.D., D.Sc., F. R. S., steps up and doffs his hat. In his own statement:—(quote) "But according to the theory of rela-

tivity "coming to rest" has no meaning"—"Nature of The Physical World."

That in itself cannot bar the imaginative supposition of such a condition from contemplation, no more than man's present inability to traverse space can bar speculation upon the possibility of doing so.

It's almost like a comforting tap on the shoulder when Professor Charles Proteus Steinmetz, A. M., Ph. D., steps up and declaims: (Quote) "... all attempts to find something immovable and fixed in the universe have failed, and thus all motion, all location, can be relative only to other objects, which are also moving."—"Relativity and Space."

It does bring back to mind the farmer, who when told of the giraffe, made his spontaneous remark, which was destined to establish itself very definitely in the annals of famous bits of the vernacular, "There ain't no sech animal." You see, he hadn't seen it, and therefore, his observations were based on what he had seen.

In effect, modern science is based on much the same premises;—upon that which has been observed by the various faculties of the human mind.

In reference to the relation of matter and velocity, we find (Fitz-Gerald factor) that the mass of an object increases in proportion to the increased velocity and decreased length of an object. At the speed of light, the mass would be infinite, the length nothing. My supposition is merely that at a condition of absolute movelessness, the mass would have diminished in proportion to the decreased velocity and increased length, until at immobility, the mass would be infinitely nil, the length infinitely expanded.

It may be pointed out that both of these arrangements are merely suppositions, prohibited by the nature of physical matter.

I don't pretend to know what would happen if a body of matter approached a stage of movelessness. It is an interesting speculation, nevertheless.

Another interesting statement by Eddington is to the effect that *velocity through ether* has been found to resemble that elusive lady Mrs. Harris; and Einstein has inspired us with a daring scepticism—"I don't believe there's no such a person." Unquote.

Einstein's velocities are all in relation to other objects. Motion is a change of position relative to *something*. If we recognize this, my "immobile" space-ship in "Relativity to the Rescue" could never have attained immobility, inasmuch as in counteracting the "ether flow" its change of position relative to the universe was in constant progress, and that change may be defined as motion, whereas it would attain a velocity equal to that of the universe moving conversely about it.

The space-ship couldn't have attained movelessness by the method described. *But if it had!*

I'm still convinced my guess would be as good as anybody's in that event. In other words, despite this discrepancy, my story is *not* based on a misapplication of the theory of velocity and relativity—but it does not explain any process whereby to approach a state of *absolute immobility*. The approach to such a state is beyond the imagination.

Nevertheless, it is oftentimes advantageous to exaggerate the limitations of human bounds in order to emphasize salient features of educational portent. On the hypothesis that I have not overstepped the bounds of credulity, any more than many another instructive thesis contained within the realms of scientific fiction, which will be apparent upon critical analysis, I present my support for my story:

It is computed that the earth makes a speed of 68,000 miles per hour around the sun; the solar system is traveling at 12 miles per second toward the general direction of the star, Vega, which moves with its galaxy in a greater galaxy around the star cluster in Sagittarius—which is just about as much motion as one would require momentarily, and for the example at hand. However, providing that our space-ship did attain a movement to counteract this "drifting," according to relativity which defines motion as a relative change of position, our space-ship would be moving as fast as the universe which moved past.

It is to be admitted that Einstein is not without antagonistic contemporaries, who view his theories partially or wholly with doubt; it is a truism that if no controversial questions be brought to bear on extant axioms, progress becomes impossible. The statements of C. P. Steinmetz may be construed in this wise—since all attempts to find something immovable and fixed in the universe have failed, and since all motion, all location, can be relative only to other objects, which are also moving—(because of this—bear in mind) the theory of relativity of matter is necessarily based on the preclusion of any body attaining absolute immobility. But there's more things between Heaven and earth, Horatio, than dreamed of in your philosophy. One might even contend that modern scientists may be like our farmer who never saw the giraffe, and because certain phenomena have never been brought under their observation, they proclaim staunchly that "there's no such a person."

New and radical ideas in science, if logically presented, are not unwelcome to thinking intelligent men. I might add that Einstein had to get his start in a way similar to that himself. Therefore there is no particular objection, as far as I can see, in assuming several things for granted in the presentation of what, at best, is an imaginative elaboration and illustration of the simpler functions of the general laws of relativity. If my narration leaves a lasting impression, engendered by elaborate design, upon the minds of the readers, in regard to Einstein's

conceptions, I shall not feel that it has been entirely in vain.

J. Harvey Haggard
940 5th Street,
San Bernardino, Calif.

Editor, AMAZING STORIES:

With the January 1935 issue of AMAZING STORIES I begin my second year with your appreciative readers. You have given us the finest in stories and in authors.

In the line-up of the authors I believe that they should be arranged thusly, with the best first:

1. Dr. David H. Keller M. D.—always interesting.
2. Bob Olsen—humorous 4th dimension stories.
3. Leslie F. Stone—good interplanetary tales.
4. Henry J. Kostkos—writes appealing stories.
5. Robert Page Preston—vivid descriptions.
6. A. Hyatt Verrill—surely knows South American archaeology.
7. W. K. Sonnemann—interesting archaeology interplanetary stories.
8. Neil R. Jones—nice space traveler.
9. H. L. G. Sullivan—lively stories.
10. Eando Binder—interesting science in stories.

Now!—that was hard to decide, since there are so many good authors. However I think everyone will agree with my first selection.

And, dear Editor, every one should appreciate and enjoy your editorials, because they are so very interesting and instructive. "Discussions" is always an interesting and lively forum for the readers who are interested or ambitious enough to write and express their opinions. "In the Realm of Books" conducted by C. A. Brandt has helped me in the purchase of two books.

You must be wearied after looking over this (as I assume you will) and I consider it only right to tell you (if I have made any breach in writing reader's etiquette) that I am but sixteen years of age, that this is my first letter to you or any other publication, and that I intend to write but one letter a year, the next of which you may count upon to receive soon after the January 1936 issue of AMAZING STORIES will have come out.

Until then, I beg to remain your humble admirer and staunch supporter,

W. W. Walther
10338 Loomis St.
Chicago, Ill.

AMAZING STORIES and other Back Numbers of
Magazines for Sale

Editor, AMAZING STORIES:

I have been an admiring reader of AMAZING STORIES for about two and a half years and I have not missed an issue. Now I have decided

to sell my small collection of 28 issues including some extra back issues that I have run across. If any one is interested in buying these please write to me and offer me your price. Most of these issues are in excellent condition with the exception of a few with the cover off. The inside of all issues are in fine condition.

John Rawlings
6521 First Street
Takoma Park
Washington, D. C.

The Terrestrial Fantascience Guild

Editor, AMAZING STORIES:

As an old reader of "our" magazine and as a fan and collector of science fiction, I am respectfully requesting that you publish this letter. For I merely wish a moment to inform your readers of the continued existence of science fiction societies that are unconnected with any commercial organizations.

In years past there used to be many such societies. But times and readers change and new clubs grow old and pass away. No more is there a Science Correspondence Club, no more an International Scientific Association, no more the Fantasy Fan's Fraternity or Scienceers. All these have gone so that today but two remain. One of the oldest of them all, rooted firm before the days of standard science fiction magazines even. That is the Terrestrial Fantascience Guild of 1935, formerly the International Science Fiction Guild of 1933 and '34, and before that far, far back the little Impossible Story Guild of a small group of Southerners. This stands today, free, unhindered by any outside group out to do business for itself, unhindered by any bonds that would destroy its right to free action for the betterment and criticism of Fantasy.

We had one short letter printed in your excellent magazine, a year ago. We built up a membership from that one letter that reached one thousand fans! Now we repeat. We wish to say to all who love the reading of science fiction, to all who would see it better, and greater than it has been, write to us. Write to our general manager Wilson Shepherd, Oakman, Alabama. We want to hear from all of you. Our aims are the betterment of science fiction in every way possible. If you have any ideas, don't hesitate to let us know them.

And what is this other society of which I spoke. That again is another that has proven itself worthy to last. I refer to the International Cosmos Science Club. An organization of science enthusiasts designed to further correspondence between other such enthusiasts all over the world. And working hand in hand with the Terrestrial Fantascience Guild's program. Together we strive for a better science and better science fiction. To all who enjoy the study of science or who would like an op-

portunity to air and defend your pet theories, write to the I. C. S. C.'s President-William S. Sykora, 31-51—41st Street, Long Island City, N. Y. You will have no cause to regret joining up with us. Thank you, Dr. Sloane.

Donald A. Wollheim
New York Representative
801 West End Avenue
New York City, N. Y.

Good Natured Criticism and Appreciation
Except for one Author's Story

Editor, AMAZING STORIES:

They may not be good drawing-cards, but the covers of our favorite verge on something almost unknown to science-fiction. Perhaps the "other two" surpass you in interior drawings, but your covers (with the exception of last October's) are ahead of the entire field by several million light-years. Morey is like the little girl with the curl; when he is good, he is very very good, and when he is bad he is horrid.

AMAZING STORIES is the "OLD FAITHFUL" of the science-fiction magazines. She weathered the depression with only a slight downward curve. She can't get back on her feet, because she's never been off them. But she has been improving, from the cover right down to page one-forty-four! Don't tell us that bulk production and underselling can kill our aristocrat! So "Happy Birthday" to AMAZING STORIES, now safely launched on her tenth year.

The April issue was marred only by that letter from Hoskins. Imagine any one throwing brickbats at poor, dear, dead J. Vernel "Earth Rehabilitators, Consolidated" was a thoroughly satisfactory story from all viewpoints, the solid kind of story that our magazine is built on. How many bright readers recognized "Mosquito Army" as a sequel to "The Call to Migrate" in the December, 1932 issue? I'll bet that Mr. Crimp can find a use for the humble bumble bee. "The Sunlight Master" was good fiction, but rather vague from the scientific angle. (Voice from the Desk: "People who live in glass houses . . .!") But I'm trying, Mr. Editor. I think that Mr. Burt had the best short story in the issue. Do you agree, Mr. Editor?

Haggard gets a whole paragraph, because I've been a long-suffering-in-silence reader of his "Mellerdrammers." First, there is his peculiar use, or misuse, of peculiar words. He speaks of windows "aberrated" with moisture. Maybe I'm wrong, but I always thought that if you "Aberrated" you wandered off, "sort of." Surely Mr. Haggard's windows didn't wander off with moisture . . .? And there are the "languoring" girls. Maybe languor has gone out and become a verb since I went to school, but I think that I should have been warned.

And then there is "vacuumized." While you were at it, Mr. Haggard, you might have tried "vacuumated." It's a good word, too. Then Mr. Haggard does things with his adverbs. "Awkward" for "Awkwardly," "Bestial" for "Bestially," "resplendent" for "resplendently"—why go on? Mr. Haggard has read too much science-fiction; before he started to write, he acquired a mess of stock phrases. "Glaring eyebrows." Did you ever see an eyebrow glare? It's awful!

"Drunken brute," "Writhing tentacles!" "Rumbling curses." "Malevolent orbs!"

Tiddly winks!!!!

And what about the time effect of the Fitzgerald contraction? Also, what about the space effect of this letter if I don't stop? This, dear readers, is the Voice from the Wilds of America, signing off.

W. B. (Wild Bill) Hoskins,
44 College Avenue,
Buchannon, W. Va.

P. X.: I'll write you another letter whenever you print this one. Anyhow that's my story and you're stuck with it.

(Your letter is characteristic and amusing, with the exception of your attack on the author of "Relativity to the Rescue." Perhaps he will answer you—now is his chance.—EDITOR.)

Back Numbers of Magazines for Those Interested

Editor, AMAZING STORIES:

I would greatly appreciate it if you would permit this small message to appear in "Discussions," direct to your readers who are looking for old copies as my collection reaches back to 1926, the year of its inception. Those interested write to

Isidore Manzon,
380 South 4th St.,
Brooklyn, New York

A Letter from England

Editor, AMAZING STORIES:

I have been a steady reader of your magazine for about four years now and I thought that I should like to show you my appreciation of your marvelous selection of authors and stories. Can you tell me what has happened to the Quarterly issue? We in England never see one now, in fact we have a rare struggle to get the monthly one. There has never yet been anything to touch Campbell's "Invaders from the Infinite." That is what we want, and the more of Campbell you put in the more mags you will sell.

Readers of Science Fiction in England are few and far between and one rarely meets a fellow reader to discuss anything with, so should anyone be interested enough to write I shall be very pleased to start a correspondence with him on the subject.

Might I say that I prefer the larger edition to this small one you are now printing? Somehow there appeared to be more in it.

By the way, I should be glad if you will let me know in your "Discussions" if it is possible to obtain your magazine direct from you by post to England, if so can you state the price (In English Money). I should like to know this particularly where the Quarterly is concerned.

I am sure that if you print this letter and a reply, you will hear more from England, as the few of us who do read these mags. would be delighted to be able to obtain them direct.

Wishing you and your great work the very best of luck.

Stanley W. F. Sealey,
89, Beechwood Road,
Kings Heath, Birmingham 14,
England.

(AMAZING STORIES QUARTERLY, while the name is kept, is really an occasional publication, sometimes devoted to reprints. AMAZING STORIES proper, comes out with absolute regularity in the United States and also in Canada. There may eventually be an English edition, but this is still undecided. The Woolworth stores are supposed to sell the magazine. The larger number of pages in the smaller sized magazine are used to give full measure to the readers. You will receive further information by mail from our Subscription Department.—EDITOR.)

A Short Appreciation and a Suggestion—The New Smaller Size Is Highly Appreciated

Editor, AMAZING STORIES:

I am an ardent lover of magazines. I have a noble suggestion. Make AMAZING STORIES a semi-monthly magazine for 15c. In the first place those who could not afford a quarter now, can get at a reasonable price of 15c. I like your artist Morey. I have been reading your 'mag.' for about a year and a half. I was overjoyed when you changed from your old size to this new one. Yesterday I dug up a back number of your mag. in a second hand bookshop and discovered a swell story "Room for the Super-Race." My next complaint is why end your stories the same old way? The pilot of our space car rescues the damsel in distress. I liked the story "Eighty-Five and Eighty-Seven. Do not publish any reprints—we pay for new stories. I must be signing off now.

Thomas Fitzgerald,
389 East 3rd Street,
Brooklyn, N. Y.

(For some reason the readers' supplies of brickbats seem to have run out. This correspondent gives his views on the smaller size of the magazine and it is not a brickbat.—EDITOR.)

A High School Sophomore Writes Some Comments

Editor, AMAZING STORIES:

While I am only fourteen, a sophomore in high school, I read every issue of AMAZING STORIES. I think that you should cut out the stories of monstrous animals and insects and put in more space travel. I hope to be a scientist or chemist when older, so I crave ideas and more facts.

I suggest you put a section in AMAZING STORIES answering questions. I have three questions to ask you. Has any scientist found the speed of the rays issuing from uranium and radium? Are scientists able to change elements to others? State instances. What is the Heavyside layer made of?

Will anybody running to the same ideas please write?

Me for more and better AMAZING STORIES,
Harry Lantz,
205 Brush Creek,
Kansas City, Mo.

(An interesting feature of the boy as an entity is that he is apt to be very positive and pronounced in his views. One of the apprehensions of the editorial staff is that AMAZING STORIES gives too many stories about space, and some exceptionally good stories have been about insects, either natural size or gigantic. We are glad to answer questions, no special department is needed. The emanations radiated from helium are designated as alpha, beta and gamma radiation. The alpha radiations are helium atoms positively charged—better expressed as helium ions. The beta radiation are a stream of negative electrons which have come from the radium atoms. The gamma radiation is described as very short ether waves. The radio-active elements disintegrate in this way and sometimes produce minute quantities of other elements. Attempts to do this artificially have not been successful unless in an infinitesimal degree. The Heavyside layer is composed of ionized gases of the air. The velocity of the alpha rays is about 10,000 miles per second; of the beta rays from 18,000 to 100,000 miles per second; of the gamma rays 186,000 miles per second, the velocity of light. EDITOR.)

Campbell, Dr. Smith and Verrill Commented On—Also Harl Vincent—Reprints of the "Skylark" Stories Asked For
Editor, AMAZING STORIES:

Several years ago while hunting around for something to read, I noticed a Quarterly edition of AMAZING STORIES. Scanning the many pages I was captivated by Wesso's drawings. I purchased the copy for an absurdly small price (15c) and began reading it. As I remember it now, it was "Islands of Space" by that master, John W. Campbell, Jr. I was so impressed by the stories, that I used up my

entire allowance buying up the other back copies of the magazine that were on sale in the store.

Ever since then I have been an avid fan of science fiction.

When I read "Islands of Space" I did not realize that this was one of the better stories and as a consequence I was disappointed when I read some others. But after a while one gets over that sort of thing and learns to enjoy a good story so much as to make up for the disappointment experienced when reading bad ones. Some of the "good stories" most recently printed are "Triplanetary" by the "Doc" (Edward E. Smith, Ph.D.) "Through the Andes" by A. Hyatt Verrill and that new Campbell story.

I can't seem to get a "kick" from any Harl Vincent stories (even "Barton's Island"). Several years ago you printed one of his stories called "Power." Recently in your mag. you printed "The Barrier." Also there appeared in another magazine "Energy" all have such a sameness about them (in their scientific phases) that doesn't seem fair to us to publish them.

For some time there has been something puzzling me. You printed the "Skylark of Space," you printed its sequel "Skylark III." Now when another much wanted addition to the series has been written, namely "The Skylark of Valeron" it appears in another magazine. How come?

I would like to mention something that will be of some interest to your readers. Many of your readers have been selling back numbers of AMAZING for 50c (or even more) a monthly (if they went back far enough). Well, I have been able to buy a number of back issues of AMAZING for 8c a copy, (1927, 1928, 1929, etc.) including one copy containing Part II of "Skylark of Space." I have also obtained the 4th Quarterly printed Winter 1928 for 15c.

Now for some (customary) suggestions. Put back the Comet-tail Title of AMAZING on the cover. Reprint "Skylark of Space" and "Skylark III" and the rest of the real old timers 1925, 1926, 1927 and 1928.—Not Poe or Verne.

"Bonne Chance" to AMAZING and to you.
Hyman Tiger,
587 Dumont Avenue,
Brooklyn, N. Y.

(You in common with many others like Dr. Smith's and Mr. Campbell's stories. Harl Vincent, whom you do not care for, has long been a favorite with our readers. You must know that we have no control over the selection of magazines by authors—they send their stories to any publication they want to, and are glad to have them accepted. The Comet-tail title for the cover is considered. The small format operates against its use.—EDITOR.)

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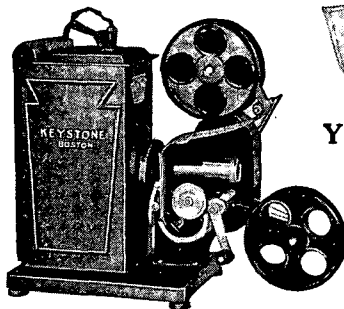
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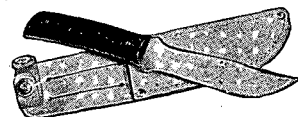
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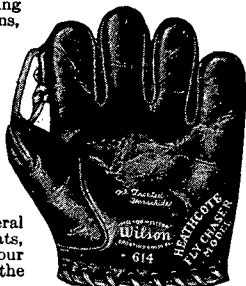
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